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DEPARTMENT OF POLITICAL AND SOCIAL SCIENCES

Why Incumbents Survive: Authoritarian Dominance and Regime Persistence in Russia

Igor Skulkin

Thesis submitted for assessment with a view to
obtaining the degree of Doctor of Political and Social Sciences
of the European University Institute

Florence, 20 September 2018

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Preface and Acknowledgements

“If we knew what it was we were doing,
it wouldn't be called 'research', would it?”

Albert Einstein

For the author, this study was not just a job. In the high school and onward, I began to arrive at the idea that something was going completely wrong in my country. Initially it was rather an unconscious feeling than a logically justified conclusion and I sensed that I needed more knowledge in politics to have a better understanding of the situation. For this reason, I decided to become a student of political science but not a lawyer or economist – professions that were the most popular at that time. My personal attitude toward the political regime under Vladimir Putin considerably worsened over time not only because I learned in the university that political freedoms were gradually restricted, the opposition was repressed, and the regime was generally authoritarian but also and primarily because of hypocrisy, various kinds of injustice and lies routinely practiced by the ruling elite under the guise of “raising Russia from the knees”. At the same time, the overwhelming electoral support for the regime stood in sharp contrast to my personal political attitude and was becoming more and more puzzling. On the one hand, intuition suggested me: “people cannot be so stupid”. On the other hand, the students from my department, who were enrolled in the presidential election of 2008 as electoral observers, described me their impressions in a typical phrase: “all in vain, I saw, everyone votes for Medvedev”.

Thereafter I continued my research predominantly focusing on the puzzle of popular support for authoritarianism. To test the null hypothesis, that is, whether voters really vote for the authoritarian incumbent or the official election results originate mainly from electoral forgery, I dwelled on the detailed examination of electoral fraud with quantitative methods of electoral fraud forensics that showed, however, that electoral manipulations were widespread, yet not outcome-changing. My personal experience with electoral monitoring in the elections of 2011–2012 supported this finding – electoral violations were numerous and almost countless in these parliamentary and presidential elections. Nevertheless, the levels of genuine popular support for Putin and United Russia as the “party of power” appeared to be too high to argue that the elections had been stolen. Consequently, I realized, authoritarian incumbents gain their power not (only) from electoral fraud but chiefly from sincere support by voters (the results of my research on electoral fraud are presented in Chapters 2–4 of this thesis).

Why then do voters give their votes for authoritarian leaders regardless of economic downturns and poor policy performance? I have to admit that this study has generally resulted in a fiasco in providing an answer to this question (however, it provides an avenue for further research in this field in Appendix F6). Initially I followed an idea commonly shared by studies of clientelism/patronage and distributive politics – people deliver their votes in exchange for material benefits provided by political leaders. But surprisingly, regardless of indicators I tried, I found no confirmation of the hypothesis of patronage voting as sincere voting for the incumbent induced by delivering politically contingent benefits. This finding strongly discouraged me for a while. Fortunately, I decided to reformulate the puzzle and look at the picture from another angle. “Why authoritarian incumbents survive” implies not only sincere voting for the incumbent but also a sub-puzzle of elite behavior. Why, in particular, do political elites perpetrate multiple authoritarian practices – electoral fraud, repression of the opposition, persecution of journalists, and others – given high potential costs to be paid due to intrinsic illegality of these practices? In this case, empirical evidence turned out to be much more favorable to the hypothesis of elite clientelism. First, the allocation of federal transfers from 2000 through 2012, along with several indicators of regional social needs, was determined by electoral support for the federal presidential incumbent candidates. Second, the balance of perks and benefits was heavily skewed in favor of political elites. Third, the amount of federal transfers was the strongest predictor of electoral fraud in Russia's regions.

Furthermore, another unexpected finding was an unpredictably important role of regional ethno-religious identity. The most politically loyal to the regime and demonstrating the highest levels of electoral fraud appeared to be the so-called "ethnic regions" – the regions with predominantly non-Russian and non-Christian Orthodox populations. That is to say, the official incumbent's vote, electoral fraud, federal transfers, and politicized ethnicity are highly correlated and sometimes almost indistinguishable. The fact that the regional ethno-religious makeup and central transfers are inextricably interrelated cannot be explained irrespectively from the specificity of the relationships between the federal center and the regions in Russia. The ethnic regions were the most rebellious in the early 1990s under Yeltsin: they signed declarations of state sovereignty and threatened the dissolution of the federation via ethnic separatism. To eliminate this threat, Yeltsin had to resort to the politics of fiscal appeasement by granting these regions larger central transfers and other benefits. When Putin came to power, he offered the ethnic regions a new deal – central transfers in exchange for political loyalty. And the ethnic regions accepted this offer. They lost nothing, they continued to receive larger transfers, yet not for the manifestations of separatism but for the demonstration of loyalty.

Thus, the path of this study was far from being typical – formulating a puzzle, looking for a theory, putting forward main hypothesis, testing and (unavoidably) confirming them. Instead, there were multiple difficulties and unexpected results that induced me to critically revisit the theory and to look at the puzzle of authoritarian dominance from an unusual angle, yet eventually to come to valuable findings. In this regard, I would slightly paraphrase the famous expression attributed to Albert Einstein cited in the epigraph: "If we knew the results of the study beforehand, it wouldn't be called 'research', would it?" or, in other words, "If we found exactly what we had initially expected to find, it would hardly be considered a true research".

The fact that this dissertation was completed is due not only to my own merit. Many other people contributed to it in various ways. First of all, I owe thanks to my mother, Tatiana, and my father, Andrei, for their continuous moral support and encouragement. While my mother was always ready to listen to my complaints regarding all the difficulties of an early academic career and found appropriate words to urge me to tolerate them, the motivation on my father's part was more of a pragmatic nature. He vividly depicted me a set of possible alternatives of my employment outside the academia none of which appealed to me as much promising as an academic career. Thus, I concluded that writing a doctoral thesis at the EUI is a much more preferable option.

Several other people also contributed, informally or indirectly, to this study. I thank my friends Tiago Silva and Nele Leosk for pulling me out from the everyday routine of filling in data tables and running regression models, as well as Margarita Zavadskaya, Maria Sakaeva, and Vladislav Lepele for their ideas, suggestions, advise, and support generously granted at all stages of this study. My sister Alina with her husband Alexei Kutuzov, and Simon Watmough are three "latent contributors" who corrected the thesis for linguistic and stylistic errors. I am especially indebted to Alina and Alexei, English linguistics majors, who volunteered their own time and effort to read and correct numerous fragments and versions of the thesis, while giving me recommendations on the use of English grammar. Without their assistance, the reader would find the text much less accessible and more troublesome. I am also thankful to Maureen Lechleitner, administrative assistant at the department of Political and Social Sciences, for her prompt and efficient handling of researchers' requests, togeather with the rest of the administrative personnel of the university. Those who have ever encountered incompetent self-interested bureaucracy know how seemingly minor administrative affairs may turn into a real problem, and see the real value in the absence of administrative burden.

Among my colleagues, I would like to express my gratitude to the participants of the workshop "Elections in Autocracies", which took place on 2-3 May 2016 at the EUI, for their discussion and useful comments to an earlier draft of Chapter 5 of this thesis – Stefano Bartolini, Jennifer Gandhi, Carl Knutsen, Jan Teorell, Margarita Zavadskaya, and, in particular, Adrián del Río with Gerrit Krol for their enthusiastic organization of the workshop. I am grateful to my reviewers who kindly agreed to thoroughly read my thesis – Prof. Vladimir Gelman, Prof. Anton Hemerijck, and Prof. John Ora Reuter – for their useful questions, recommendations, and remarks to an earlier draft of the dissertation. The members of the jury jointly contributed to a substantial improvement of the thesis by stimulating me to look at my work from a broader perspective and highlighting those particular shortcomings that typically escape notice of a single author.

I am especially grateful to my supervisor, Prof. Hanspeter Kriesi. He believed in me when I did not believe in myself. Numerously, he extended the deadlines for submission of parts of my work and, even though I was very far behind the schedule, he always urged me not to give up and encouraged me to write further. He devoted much time to discussing the problems of my study and the issues beyond it. Although the areas of our studies and our research interests are largely different, Prof. Kriesi managed to give me precise technical and theoretical recommendations. However, the most important turned out to be strategic recommendations that cannot be simply put into words. For example, when my research completely came to a halt, the recommendation was simple – just continue writing anything – and it worked. Making progress on the issues of minor importance (as they seemed to be at that time) allowed me to see a broader picture and eventually find the main path for the study. Giving this simple and seemingly trivial advice in an effective manner, I believe, would be impossible without a high-level craftsmanship in scientific guidance and genuine profound concern for the needs of supervisees. I wish Prof. Hanspeter Kriesi, along with his own academic achievements, to help many more young researchers develop their talents and to set them on the right path in the future.

Finally, I thank God for giving me the opportunities to meet such kind people without whom this dissertation would have decidedly been unwritten.

Abstract

Why do incumbents in electoral authoritarian regimes retain power? This study seeks to answer this fundamental question by linking electoral fraud and sincere voting for the incumbent with incumbent's distributive politics and, accordingly, by looking at the puzzle of authoritarian survival from two perspectives. An elite-oriented incumbent's strategy suggests that, unlike democracies, where distributive politics is primarily targeted at voters, authoritarian incumbents inevitably have to deliver benefits to political elites in order to secure their loyalty, which is eventually converted into electoral fraud, repression of the opposition forces, persecution of the media, refraining from challenging the incumbent, and other authoritarian policy outcomes. A mass-oriented incumbent's strategy implies that, if electoral competition is not meaningless, authoritarian incumbents also have to deliver benefits to the general public in order to secure genuine mass support, which eventually results in sincere voting for the incumbent. This argument is tested on cross-regional data from Russia as a prominent case of persistent electoral authoritarianism. The analysis begins with a poorly studied but an immanent element of any kind of authoritarianism – electoral fraud perpetrated by political elites and their local agents. Having developed a novel measure of electoral fraud forensics based on quintile regression, I demonstrate that electoral fraud in the Russian 2000–2012 presidential elections played a typical role for electoral authoritarianism: it was neither outcome-changing as it occurs in closed authoritarian regimes nor intrinsically sporadic as in electoral democracies, but it was widespread and hardly avoidable by the incumbent. The study then dwells on examination of the federal transfers to regional budgets as a type of public and formally legal yet politically motivated distribution. Not only were the central transfers allocated to the regions according to the principle of electoral allegiance to the federal incumbent presidents, but it also appears that, as authoritarian regime was consolidating over time, the larger amount of transfer funds was allocated to the bureaucracy (as part of the regime's elite clientele) in order to secure its loyalty. The loyalty of regional elites, in its turn, was eventually converted into distinct authoritarian policy outcomes, including electoral fraud and persecution of the media. This resulted in a general bias of the electoral playing field and, thereby, contributed to sustaining the authoritarian equilibrium. By contrast, the analysis finds no evidence that the politicized transfers influenced sincere voting for the incumbent. These mixed findings indicate that popular support under electoral authoritarianism is still puzzling and calls for further examination, whereas securing loyalty of political elites via delivering them clientelist benefits is crucial for regime survival in personalist electoral dictatorships.

Contents

Chapter 1. The Puzzle of Electoral Authoritarian Dominance

Introduction

After the collapse of the Soviet Union and the fall of socialism around the world, an unprecedented number of democratic transitions occurred (Huntington 1991; Doorenspleet 2000, Przeworski et al. 2000: 44; Geddes, Wright and Franz 2014: 316). Nonetheless, very soon it turned out that few of the newly-established democracies succeeded in their way to establish fully competitive systems. The lion's share of these transitions ended up with fragile hybrid regimes known as pseudo-democracies, façade democracies, electoral democracies or illiberal democracies, political life in which is marred by feckless pluralism, the lack of rule of law, and recurrent violations of civil liberties (Collier and Levitsky 1997; Zakaria 1997; Carothers 2002). Other political regimes did not merely get "stuck in transition", but overtly returned to authoritarian forms of government, even though in updated non-Socialist, non-military, generally speaking, non-fully dictatorial forms. Since multiparty elections have become the worldwide standard of "democracy", former authoritarian rulers and their successors have had little choice but to run the gauntlet of this regular inevitable institutional threat to their power in order to gain international legitimacy. For this and other reasons (Gandhi and Lust-Okar 2009), the adoption of democratic institutions in formerly closed authoritarian regimes has frequently resulted in transition to electoral (Schedler 2006) or competitive (Levitsky and Way 2002; 2010) authoritarianism. A widespread view on this kind of political regimes is that electoral playing field is highly uneven and heavily skewed in favor of the incumbent by political repression and electoral malpractices. As a consequence, incumbents in these regimes win elections with huge margins and the opposition can only dream about victory.

Why do incumbents in electoral authoritarian regimes manage to stay in power? Why, in particular, do political elites perpetrate multiple authoritarian practices – electoral fraud, repression of the opposition, persecution of journalists, and others – given high potential costs to be paid due to intrinsic illegality of these practices? Why do voters give their votes for authoritarian leaders regardless of economic downturns and poor policy performance? To what extent do intrinsically authoritarian practices, especially electoral fraud, contribute to persistence of electoral authoritarianism and can authoritarian leaders refrain from their use?

This study seeks to answer these questions by considering the determinants of authoritarian regime survival with a special focus on Russia.

After the turbulent events of the early 1990s, Russia has evolved from an almost failed state and electoral democracy toward one of the most emblematic cases of consolidated electoral authoritarianism. Vladimir Putin was welcomed as a national hero after the 1998 economic crisis, governmental turmoil, terrorist attacks, and the war in Chechnya. The presidential election of March 2000 demonstrated his triumph. Several observers claimed this outcome to be a result of electoral investments in future expectations. The long-awaited economic recovery was in fact favorable to these expectations until 2008 when the Global Recession has affected the Russian economy, which became more internationally integrated and dependent on exports of natural resources in the first decade of Putin's rule. The economic troubles coincided with regime's first electoral losses during the electoral cycle of 2011–2012 in which United Russia, the "party of power", did not manage to obtain a constitutional majority of seats in the State Duma, the incumbent's vote declined by seven percent, and, more importantly, the regime encountered the first strong wave of post-electoral protest. While the Russian economy has been rather stagnating after 2008, a positive impetus of the economy on regime's popularity has obviously been exhausted by the end of 2014 when oil prices slumped nearly twofold and then established at such low level with a weak tendency to upward correction until 2018. As a result, the country lost a considerable share of its income. In spite of this fact, United Russia regained a constitutional majority and Putin received an impressive 76.7% of the vote in the elections of 2016 and 2018, respectively.

In a parallel process, immediately after Putin took power in 2000, a new course was set for restricting political rights and suppressing civil liberties. The first attack occurred on freedom of the media. The most critical TV channel – NTV – part of oligarch Vladimir Gusinskiy's Media-Most holding, was prosecuted simultaneously under several articles of the Criminal Code in 2000. Under duress, Gusinsky has had to flee Russia and NTV was sold to the state-controlled company Gazprom. Once NTV's leadership has been changed, its media policy became much more pro-incumbent. Governors began to emulate this model of using law-enforcement bodies of the state for influencing independent journalists and media companies at the regional level. Consequently, criticizing state authorities has virtually become inadmissible in the most of public media. Next, a new electoral legislation was adopted in 2001 that tightened requirements for registration of parties and candidates and togeather with numerous amendments, which followed in subsequent years, it have restricted electoral competition so tightly that only 7 political parties managed to keep their official registration by 2012, compared with 44 in 2003, and the number of presidential candidates decreased from 11 in 2000 to 4 in 2008. Besides this, under the pretext of war on terrorism, direct gubernatorial elections were canceled after the 2004 terrorist attack in the North Ossetian city of Beslan, which claimed the lives of over than three hundred people. The law-enforcement state apparatus was also began to be used for political repression. Opposition candidates, their assistants, and ordinary activists were subjects to multiple unmotivated detentions during electoral campaigns. Businessmen were intimidated that they are to lose their businesses if they will donate to the opposition. While the regime has initially lacked legal tools for repression, the articles of the Criminal Code 282 (the "Extremism Law") and 280 (on "public calls for extremist activities") with their numerous amendments gave great opportunities for law-enforcement agencies to act on their own discretion with regime dissenters, including placing them in jail for comments in social networks. Finally, incumbent's engagement in electoral fraud became a routine self-evident practice when individual polling stations and entire regions began to report absolutely untrustworthy election results with the incumbent's vote exceeding the 80-percent level. As a result, Russia was estimated to be a non-free country by the Freedom House organization in 2004 and it holds its authoritarian status thus far.

Notwithstanding the success of the authoritarian consolidation of the 2000s, the regime's limits of power were identified during the election cycle of 2011–2012. The Russian parliamentary election of December 2011 was heavily criticized by opposition forces as fraudulent. Civil activists who conducted electoral monitoring and collected copies of polling station protocols reported that United Russia gained 31.2% (Oreshkin 2011) or 34.3% (RuElect 2011) of the vote. The Central Electoral Commission declared it to be 49.3%. This discrepancy between the actual electoral support and the officially declared result triggered a nation-wide wave of mass protests. Civil enthusiasm sprang up from anticipation of an opposition victory resulted in the most prominent electoral observation campaign ever seen in Russia. More than twelve thousand observers scrutinized the presidential voting in March 2012. Yet, this time the official result of Vladimir Putin was much closer to the data of electoral observers: 63.6% officially declared versus 54.3% (Combined Protocol 2012) and 51.3% (SMS-CIK 2012) reported by observers. Both citizens and opposition forces recognized that Putin, in fact, received as many votes as he would have won even without resorting to fraud. Although the wave of post-electoral protest has eventually come to naught, the regime had to make political concessions. The legal restrictions on electoral competition were relaxed so that the number of registered parties increased to 56 by the end 2013 and 8 candidates were allowed to compete in the presidential election of 2018. Direct gubernatorial elections were reintroduced in 2012. Few or none concessions, however, were made in the areas of political repression and media bias. Nor was an independent electoral commission or a system of electoral monitoring established. The incumbent's victories in 2016 and 2018 have again demonstrated the persistence of electoral authoritarianism.

Thus, Russia's recent political history provides fertile land for competing explanations. The incumbent's dominance can be viewed from different angles – economic advantages, electoral fraud, political repression, persecution of journalists or manipulation with electoral laws – yet none of these explanations provide *prima facie* evidence in favor of decisiveness of its effect. Do these and other factors contribute equally to authoritarian survival? Or are there factors of primary and subsequent order? Is there, metaphorically speaking, gasoline that sets the engine of authoritarian politics in motion?

In this dissertation, I argue that electoral fraud, political repression and other intrinsically authoritarian practices are immanent characteristics of electoral authoritarianism. Their role, however, should neither be exaggerated, nor underestimated. On the one hand, as opposed to closed authoritarian regimes, electoral fraud is not outcome-changing and political repression does not take the form of mass terror, that is, the scope of authoritarian practices leaves some space for electoral competition under electoral authoritarianism. On the other hand, such informal practices are embedded into the nature of authoritarianism. Authoritarian incumbents cannot refrain from their use without losing loyalty of political elites. This conclusion directly follows from the core argument of the study: authoritarian incumbents secure loyalty of political elites by offering them material benefits and political elites signal their loyalty by implementing authoritarian policies in response. More specifically, electoral fraud and other authoritarian practices are typically carried out by political elites, which would hardly consent to bear high risks and pay high costs associated with these illegal practices gratuitously. Hence, unlike democracies, where the distributive game is played primarily to win votes, authoritarian leaders have inevitably to please political elites in order to secure their loyalty, which is eventually converted into electoral fraud, repression of the opposition, persecution of the media, refraining from challenging the incumbent, and other authoritarian outcomes. At the same time, despite voter coercion, vote buying and other types of electoral fraud perpetrated through the mediation of political elites, authoritarian incumbents have also to secure loyalty of some fraction of voters for their sincere voting. Thus, the argument of this study is twofold. In a concise form, it implies that incumbents in electoral authoritarian regimes deliver clientelist benefits to political elites in order to secure their loyalty, which is subsequently converted into various formal and informal practices aimed to bias the electoral playing field in favor of the incumbent, and they also deliver patronage benefits to voters in order to obtain their political support, which translates into sincere voting for the incumbent.

The remainder of the introductory chapter develops the argument in more detail by gradually moving from a broader to a narrower perspective. The next section presents an overview of major theoretical approaches to electoral authoritarian dominance in the context of this study. The third section draws a distinction between democratic and authoritarian practices designed to bias the electoral playing field in incumbent's favor and shows their combination in different types of political regime. I argue herein that authoritarian tools of dominance are in no case legal (they can be also called informal practices), whereas the tools employed in electoral democracies to bias the electoral playing field are legally permitted. Electoral authoritarianism implies the widespread use of *both* legal and illegal tools of dominance. In this regard, electoral authoritarianism, as opposed to closed authoritarianism, cannot rely *exclusively* on informal practices – electoral fraud, repression or voter coercion. From this standpoint, I conceptualize patronage/clientelism in the fourth section. The contemporary literature on clientelism has two faults. First, it overemphasizes the incumbent's opportunity to monitor electoral behavior and withdraw goods from opposition voters. In doing so, the literature implicitly equates clientelism to voter intimidation ("punishment regime"). Another sort of literature explicitly equates clientelism to vote buying. In both cases clientelism appears to be an informal practice (voter intimidation and vote buying are treated as two types of electoral fraud in this study) that leaves no room for sincere voting and makes electoral competition meaningless. Contrary to this literature, I argue that clientelism should be a formal practice. Second, the literature does not differentiate between the politically contingent distribution in democracies and autocracies. As a result, multiple authoritarian practices turn out to be unexplained. It is argued in this regard that taking the distribution targeted at elites into consideration is crucial for explaining electoral fraud, repression, persecution of the media, and other authoritarian practices perpetrated by political elites, whereas the distribution favorable to voters result into sincere voting for the incumbent. This argument is presented in an aggregated form in the fifth section. In the final section, I discuss the case of Russia in comparative perspective. In particular, I claim that Russia pertains to a type of neopatrimonial personalist regimes and overview its generic characteristics vis-à-vis party-based regimes.

Theoretical Approaches to Electoral Authoritarian Dominance

Incumbent victories with huge margins and high turnout rates are common in electoral authoritarian regimes. A multitude of them have successfully managed to survive through economic crises and external democratizing pressure. There are several approaches seeking to answer why authoritarian regimes persist. Without making attempt to compile a full "menu of manipulation" (Schedler 2002) or to present an exhaustive survey of the existing literature, this section aims to delineate the main explanations of authoritarian survival, to discuss their strengths and weaknesses, and to find possible theoretical lacunas, which can be filled in this study.

Economic Explanations

A classical theory of economic voting (Downs 1957; Kramer 1971; Fiorina 1981; for a review see Lewis-Beck and Stegmaier 2000) stresses the importance of economic conditions for incumbency survival. Positive perceptions of personal economic situation (the pocketbook hypothesis) or national economic conditions (the sociotropic hypothesis) are typically translated into reelection of the incumbent, whereas voters with negative perceptions of the economy tend to punish incumbents at the polls. Cross-national studies revealed that retrospective, prospective and affective evaluations of government economic performance exert statistically significant and substantively strong effects on the likelihood of a vote for the incumbent coalition in four developed democracies (Lewis-Beck 1986); GDP growth, inflation, and unemployment in interaction with the "clarity of responsibility" determine the change in governing party's vote share in 19 industrialized democracies (Powell and Whitten 1993); GDP growth influences the vote of the major party in office in 38 countries holding, according to Freedom in the World, free or relatively free elections around the world (Wilkin, Haller and

Norpoth 1997); and current economic conditions influence differently electoral chances of two types of incumbents – primary and other incumbents – in five East European transitional countries (Tucker 2001).

However, very little attention has been paid to comparative studying of economic voting beyond the spectrum of democratic regimes. Studying authoritarian dominant party regimes, Greene (2010) found that GDP growth reached statistical significance in only three out of six models of dominant party's margin of victory. In contrast to Yeltsin's period (Colton 1996), when Russia was an electoral democracy, studies reveal a weak effect of the economy on the vote in the Putin era (Schofield and Zakharov 2010; Treisman 2011[1]).

Such poor empirical confirmation of the economic voting hypothesis in authoritarian regimes is theoretically predictable. If analysis relies on official election results, the dependent variable appears to be intrinsically biased due to vote buying, voter intimidation and other practices of electoral fraud. Using survey data on incumbent popularity may help to avoid this bias, yet mass surveys are not necessarily reliable under authoritarianism. Moreover, popular economic perceptions are manipulated by the incumbent-controlled media that do not deliver objective information but rather misinterpret facts, report false information and divert public attention to other (frequently minor) issues. Finally, even if public dissatisfaction with the economy increases, it cannot directly translate into anti-incumbent voting since opposition parties and candidates, as a result of incumbent strategies toward opposition elites, turn into political radicals who are out of step with the median voter (Greene 2007), political loyalists (Lust-Okar 2004), regime collaborators (Bunce and Wolchik 2010), and other repulsive alternatives.

Economic shocks may theoretically influence authoritarian incumbency survival through other mechanisms than economic voting. Londregan and Poole (1990) found that lower levels of economic growth increase the probability that a government is overthrown by a *coup d'état*. Reuter and Ghandi (2011) demonstrate that the likelihood of elite defection from hegemonic parties increases in the periods of economic decline. However, if we assume that economic shocks *equally* affect the probability of regime breakdown in democratic and authoritarian states, then we should observe an alternation in power resulted from economic downturns in nearly

[1] Contrary to the general argument in the article, the change in perceptions of the current economy explains much more variation of the change in Yeltsin's popularity (t-value = 8.3, Model 5 in Table 2) compared with the change in Putin's popularity (t-value = 2.1, Model 7 in Table 3). The major share of explanatory power of the Putin popularity model comes from dummy variables, which primarily contribute to a high R-squared.

equal frequencies between democracies and autocracies – this expectation is definitely far from reality. In particular, Gazirowski (1995: 889) show that economic growth has a negative effect on the probability of democratic breakdown (i.e. slumps undermine democracies), whereas changes in the economy have no significant effect on democratic transitions from autocracies. Przeworski et al. (2000: 110) show that 2.4% of dictatorships, which experienced a prior economic decline, have eventually become democracies, whereas 4.2% of democracies have drifted into dictatorships after an economic recession. And this result is only partial inasmuch as the fact of losing elections by the incumbent, which may occur due to an economic crisis, is an ordinary practice in democracies that is quite not necessarily associated with regime change. In autocracies, by contrast, losing power by the incumbent in the electoral contest almost always implies democratization. Thus, the effect of economic hardships on incumbency survival is less pronounced in authoritarian regimes than in democracies.

Presumably, not short-term fluctuations of the economy but long-term economic development should do away with authoritarianism. One of the first in the field to make such a claim, Lipset (1959) suggested that the more developed (i.e., the wealthier, the more industrialized, urbanized, and educated) a nation is, the greater the chances that it will sustain democracy. The earlier studies used energy consumption as a proxy to economic development and found that it is positively linked to democracy (Jackman 1973; Bollen 1979). In a more consistent way, the developmentalist hypothesis offered by Lipset has been tested by Barro (1999). His study has shown that only per capita GDP, the share of Muslim population, and a country's dependence on oil export have strong effects on Electoral Rights and Civil Liberties scores, whereas the effects of other variables associated with development (life expectancy, infant mortality, education, and inequality) appeared to be feeble or insignificant. Other studies (Bollen and Jackman 1985; Timmons 2010) found no relationship between economic inequality, which is perhaps the most important for the developmentalist argument so long as the low inequality is associated with strong middle class, and democracy.

The later examination of economic development theory by Przeworski and Limongi (1997) and Przeworski et al. (2000: Ch. 2) specified that economic development gives more chances for democratic survival (they called it exogenous democratization) but it does not lead to democratization of authoritarian regimes (endogenous democratization). They concluded that "[t]he emergence of democracy is not a by-product of economic development. Democracy is or is not established by political actors pursuing their goals, and it can be initiated at any level of development. Only once it is established do economic constraints play a role: the chances for the survival of democracy are greater when the country is richer" (1997: 177).

Boix and Stokes (2003) challenged this finding. Extending the sample back to the year 1850 and using dynamic probit modeling, they found statistically significant confirmation for the endogenous democratizing effect of economic development. Quantitatively, however, the results are rather favorable to the exogenous theory: the estimated probability of democratic breakdown sharply decreases from roughly 77 to 5 percent as the level of per capita income increases from its minimum of $1,000 to $5,500, whereas the probability of transition to democracy increases almost indistinguishably from 4 to 6 percent as the level of per capita income increases from its minimum of $1,000 to the maximum of $12,000 (see p. 537). The marginal change in probabilities of democratic transition is more pronounced if the Soviet and oil countries are excluded: the probability increases from 6 to 33 percent, however, this effect is still about four times smaller than the effect of exogenous democratization. Hence, economic development rather keeps already-existing democracies afloat but it is unlikely to lead to a democratic transition from authoritarian rule.

Acemoglu et al. (2009) argue that there is no a causal effect of income on democracy at all. They show that once country fixed effects are controlled for or parameterized random effects are included, the correlation between income and democracy, and the likelihood of transition to and from democracy disappear. Boix (2011: 816) attributes this null effect to a reduced number of countries and years in the sample of Acemoglu and colleagues. He also uses fixed-effects OLS regressions with country and time dummies, yet preferably with 10-year lags for democracy and GDP (that also reduces the number of observations), and finds a positive effect of income on democracy.[2] This effect is, however, significant in only two out of five historical periods indicating that lag selection crucially impacts the results. Substantively, there is unclear why historical rather than current levels of the economy should influence the current level of democracy.[3] And if this effect appears

[2] If a 5-year lag is chosen, the effect of GDP is significant (primarily due to N = 2,172) but small (0.036 versus 0.660 – the effect of the lagged democracy). Using a 10-year lag decreases the effect of the lagged democracy to 0.374 and increases the effect of GDP to 0.124. See Table 1 in the article.

[3] A 25-year lag yields even a stronger effect – 0.172 compared with 0.124 (the 10-year lag effect), even though the former is less significant (primarily because the 25-year lag model's N is smaller (295) than the 10-year lag model's N (989)). See Table 1 in the article.

as a result of a diminishing explanatory power of the lagged dependent variable (LDV) at larger lags, why is the lagged dependent variable used in the cross-section analysis?[4] A full-fledged time-series analysis would allow to examine the effect of time much better than the LDV.

Apart from this, if a causal relationship exists, not only cross-sectional but also time-series correlation between variables should be present in the most of cases.[5] Nevertheless, despite the over than fifty-year history of extensive research, the time-series dimension of the relationship between democracy and development has neither been duly examined nor a robust relationship has been demonstrated. Goldstone and Kocornik-Mina (2005) traced trajectories over time of all sovereign nations over 500,000 in population between 1955 and 2000 in a two-dimensional democracy/development space. Their results, however, "provide only slim support for the notion that the 'Authoritarian transition' model is an effective path to democracy; most autocratic regimes neither experience sustained economic growth nor experience transitions to democracy, even those that reached incomes in excess of the most common transition level ($6,000 gdp/cap)" (p. 26). Very few countries (among which Taiwan and South Korea) have experienced gradual, multi-step improvements in both democracy and income directions, as predicted by theory. In other cases, sudden transitions have occurred after authoritarian economic growth (Spain, Portugal, Hungary, Cyprus) and after authoritarian stagnation (Chile, Argentina). In many cases, political regime and economic development vary over time independently of each other in a haphazard manner (Nigeria, Peru, Ghana, Fiji).

The Russian case is in line with the skeptical view on democratization by economic development. In spite of the fact that Russia has become a "normal" middle-income country like Argentina, Brazil or South Korea (Shleifer and Treisman 2005), it has not yet undergone a democratic transition. Furthermore, Russia under Putin has become wealthier than under Yeltsin but more authoritarian. In this study, I decompose the official incumbent's vote share into two parts – one consisting of the genuine incumbent's vote and the second resulted from electoral fraud. In multilevel models encompassing the period of 2000–2012, I found no

[4] It generally follows from Table 1 in the article that the effect of GDP gets stronger at larger lags proportionally to a diminishing explanatory power of the LDV at larger lags – 0.660 at the 5-yer lag, 0.374 at the 10-yer lag, and 0.225 at the 25-yer lag.

[5] The simultaneity of cross-section and time-series relationship can be violated in some cases. In Chapter 5, I argue that the central government can elaborate such rules of allocation of central transfers that the most loyal supporters were constantly rewarded, if the group of supporters is stable over time and sizable enough to overweigh fluctuations in the vote of other groups of the electorate.

consistent effect neither of the level of gross regional product (GRP) nor of GRP growth on electoral fraud and found only modest effects of these variables on the sincere voting for the incumbent (see Chapter 6).

Thus, the prerequisites of democracy related to economic development are probably necessary but definitely not sufficient conditions for authoritarian breakdown. It is also worth noting that regardless of the impact of the economic indicators on the future trajectory of authoritarianism, incumbents are in no position to manipulate them for the purposes of creating incumbency advantage.

Political Repression

O'Donnell (1988: Ch. 9) has shown that worsening of economic conditions was accompanied by political violence from the sides of guerilla and the government in the Peronist Argentina. The actions of state's security apparatus and extralegal procedures were so important that "taking them into account is indispensable for understanding the crucial place that violence, and the fear of violence, came to occupy in the lives of Argentines" (p. 297). More recent studies came to mixed conclusions with respect to the extent of repression in various regime types and political effects of repression. Regan and Henderson (2002) found an inverted u-shaped relationship between regime type and repression. Other studies claim that there is a threshold effect – movement from closed autocracy to electoral democracy does not lower the level of repression until a threshold of 0.8 at 0 – 1 scale (Bueno de Mesquita et al. 2005) or 8 at 10-point scale (Davenport and Armstrong 2004) is reached, that is, only full democracies are less repressive. Building analysis upon a sample of both democratic and authoritarian leaders, Bueno de Mesquita and Smith (2010) found no significant effect of repression on leader survival rates. Escribà-Folch (2013) included only authoritarian leaders in her dataset and uncovered that physical repression (measured by the Political Terror Scale) decrease only the likelihood of nonviolent ruler exit, while restrictions on civil liberties (measured by the corresponding Freedom House's scale) produce negative effects on both violent and nonviolent types of ruler exit from power.[6]

[6] The reliability of the dependent variable, which is the Political Terror Scale (PTS) or its composite sources – Amnesty International (PTS_A), Human Rights Watch (PTS_H), and the US Department of State (PTS_S), is questionable in these and similar studies. A critical article by McCormick and Mitchell (1997) discusses a conceptual problem of aggregation of different types of political terror – the use of imprisonment versus the use of torture and killing. Besides this, the PTS does evidently not capture what it is designed to capture (Wood and Gibney 2010), namely, *state-sponsored* repression for political reasons. In 1992, the first year for which the

If the use of repression for creating incumbency advantage is discussed, it should be noted that a ruler's reliance on a large-scale repression is limited by costs and unintended consequences that repression may entail. It may, for instance, spur mass protests (Francisco 1995; Kricheli, Livne and Magaloni 2011). Bratton and Masunungure (2006: 23) argue that a massive "urban clean up" campaign led by ZANU-PF in Zimbabwe "ultimately undermined the legitimacy of key state institutions, notably the police force, and boosted overt political support for the Movement for Democratic Change". More importantly, from a dictator's point of view, large-scale repression dangerously strengthens repressive bodies of the state that increases their capacity to overthrow the dictator (Svolik 2012: Ch. 5). Svolik (2012: 11) metaphorically describes this threat by noting that "[a]authoritarian reliance on repression is thus a double-edged sword: It shows the seeds of future military interventions." A regime of unlimited repression also creates discontent among the ruling elite, which suffers from permanent purges. In this connection, Khrushchev relaxed Stalin's regime of terror at the XX party congress being primarily guided by "class" interests, that is, to exclude the Soviet *nomenklatura* from the threat of extralegal physical repression. Politicians, thus, have to rely on harsh mass repression when other tools of political survival are unavailable.

Modern dictatorships, as Guriev and Treisman (2015: 3) show, use violence sparingly compared with their counterparts from the 1980s. This also holds true for Putin's regime. It does not rely on political repression as heavily as did the Bolsheviks in their early period soon after the seizure of power (Melgunov 1926) or during Stalin's rule (Solonevich 1938). Instead of crude violence, the regime relies more on violation of civil liberties by taking under custody and penalizing peaceful

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scores are available, the level of repression was relatively low in Russia: the PTS_A = 2 and the PTS_S = 3 (at 1 – 5 scale). In the next year, when Yeltsin has undertaken a military assault of the parliament in which numerous unarmed citizens who were trying to defend the parliament were killed, the PTS scores remained unchanged. Then the scores varied between 3 and 5 during the 1990s in unexplainable manner. The PTS_A has reached its maximum of 5 in 2000 and the PTS_S has also reached 5 in 1998. The codebook construes the level 5 of terror as follows: "[t]he terrors of Level 4 have been extended to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals" (the data and the codebook are available at: http://www.politicalterrorscale.org). Judged impartially, this definition was empirically met in Russia only in times of Stalin. The PTS_A and the PTS_S were constant at the level of 4 under Putin's rule from 2001 through 2016 (an exception is the PTS_A in 2015 = 3). Neither the PTS responds in a consistent way to a growing repressive capacity of the state apparatus under Putin, nor does it respond to election-related mass detentions of opposition protesters in 2008 and 2012 in Russia. Other countries can be discussed respectively but a nearly null share of explained variance in a country, for which the relevant information is largely available, is sufficient to understand why the literature does not find a clear-cut distinction between closed and electoral autocracies and electoral democracies with respect to the scope of political repression. In the next section of this chapter, I offer a theoretically driven classification of the scope of informal practices, including repression, by several regime types, which differs from findings of these studies.

demonstrators, especially in relation to post-electoral protest, and by prosecuting most serious opponents "for extremism" applying the article of the Criminal Code No. 282 – the Federal Law On Counteracting Extremist Activity ("Extremism Law"), which effectively allows to place citizens in jail for their comments in social networks. The number of convicts under the article 282 rose from 137 in 2011 to 414 in 2015, the major group of them consists of nationalists (Dergachev and Vinokurov 2016). It must be noted that such litigations do not follow the logic of formal institutions. Although the Extremism Law *de jure* allows for prosecution of citizens who publically criticize state officials – in this regard, it is in fact a legal tool against the opposition – the Extremism Law contains no explicit definition of extremism. Instead it offers a highly vague and heterogeneous list of activities considered to be extremist.[7] As a result, "no one publicly criticizing the state, its policy, and public officials, even with a good understanding of the current legislation, can predict whether his words contain signs of extremism" (Roudik 2014). For this reason, the application of the law in courts largely depends on expertise. Experts frequently come from state structures or institutions affiliated with the state, they do not have sufficient competence in area they examine, whereas reports of alternative experts are routinely disregarded (Roudik 2014; Rozalskaya 2011)[8]. Therefore, article 282 is rather a contemporary analog of the notoriously known article 58 "on counter-revolutionary activity" of the criminal code from the Soviet past. Both articles are highly targeted at political opposition, while their enforcement practices have nothing in common with law. Their essence is repression.

In this study, I do not examine state-sponsored repression in detail. However, it is puzzling why, given a potential cost of repression (repression is an illegal practice and its perpetrators will have to be subjects of criminal punishment if a committed to the principle of rule of law government comes to power), do state officials still

[7] Interestingly, among these activities, one kind of activity is especially endemic to numerous state officials, including the president: "preventing citizens from exercising their electoral rights and the right to participate in a referendum, or violating the secrecy of the vote, combined with violence or threats to use violence". Chapters 2–4 provide evidence for this proposition. Simultaneously, this dissertation, until its findings are not defended in court, is unequivocally defined as an "extremist material". A penultimate item in the list states that "dissemination of knowingly false accusations against federal or regional officials in their official capacity, alleging that they have committed illegal or criminal acts" also constitute extremist activities. Those who will read or publish this dissertation should take this into consideration.

[8] See also other reports and materials on extremism issued by the SOVA Center for Information and Analysis at: https://www.sova-center.ru/en/misuse/reports-analyses/. Videos by Andrey Saveliev, ex-deputy of the State Duma fraction Rodina, can also be helpful as first-person information from the litigations, sometimes in the role of expert. See a series of videos entitled RN-Extreme on Youtube, for example, RN-Extreme. Grudinin and Article 282: Repression in Sergiev Posad [*RN-Ekstrim. Grudinin i 282-ya statya, Repressii v Sergiyevom Posade*] at: https://www.youtube.com/watch?v=4AAMdZsh57Q.

perpetrate it? The main argument of the study, which is more diligently developed with respect to electoral fraud, can be applied to all authoritarian practices, including political repression. The argument suggests that regional elites, local agents and other actors are rewarded by the regime for their authoritarian activities and these actors signal their loyalty to the regime by implementing authoritarian practices in order to receive material benefits in return.

Electoral Fraud

Electoral malpractices and blatant falsification of election results may also account for high turnout rates and impressive vote shares in authoritarian regimes. Anecdotal stories, media information, and electoral observers support this assertion. The literature on electoral fraud also offers evidence in favor of this hypothesis (Schaffer 2007; Alvarez, Hall and Hyde 2008; Mebane and Kalinin 2009; Myagkov, Ordeshook and Shakin 2009; Beber and Scacco 2012; Kobak, Shpilkin and Pshenichnikov 2012; Simpser 2013; Rozenas 2017). However, scholars argue that elections under competitive authoritarianism “are generally free of massive fraud” (Levitsky and Way 2002: 53) and that electoral fraud does not play a decisive role but is rather used as an additional or temporary tool when a dominant party’s patronage fund exhausts (Greene 2007: 34; Magaloni 2006: 21–23). These assertions have rather a normative character since the amount of electoral fraud in electoral authoritarian regimes has not been studied properly in quantitative terms. Falsification of electoral results is still a sort of latent variable that is only implied “by default” in non-democratic regimes but its real values remain unknown.

In this study, I examine electoral fraud thoroughly to fill this gap in the literature, at least partially. Chapter 2 discusses types of electoral fraud. Then, I review existing methods of election forensics in Chapter 3. And, taking finding of these two chapters into account, in Chapter 4, I develop a novel approach based on quantile regression applied to the distribution of the incumbent’s vote conditionally on the level of turnout to estimate the qualitative and quantitative amount of fraud in the Russian presidential elections from 2000 through 2012. Although the analysis includes only the case of Russia and does not allow for cross-sectional variation of electoral fraud between several countries and types of political regime, the cross-temporal data on electoral fraud makes possible to trace the variation of electoral fraud conditional on regime type. The results show that the scope of electoral fraud was the least in 2000 (it could be assessed as equal to an upper threshold for electoral democracies), when authoritarianism was only beginning to be established, then electoral fraud proliferated and reached its maximum in 2008 and after that decreased slightly in 2012 as a result of a large-scale electoral observation campaign driven by enhanced opposition activity during the election cycle of 2011–2012. Consistently with theoretical expectations proposed in the literature, electoral fraud has not substantively affected election outcomes; Putin and Medvedev could have seemingly won without resorting to fraud. At the same time, it was widespread and essential for regime survival. Specifically, electoral fraud appears to be inextricably linked with the regime by two main factors. First, increasing the probability of losing power in elections by refraining from fraud is unacceptable for authoritarian incumbents due to high costs of losing power under authoritarianism. Second, electoral fraud, as Chapter 5 and 6 of this study show, is "embedded" into the mechanism of distributive politics that is designed for rewarding regional elites for their political loyalty. Refraining from fraud would imply dismantling of, at least, one such a mechanism that allows the incumbent to secure loyalty of the elite.

The cross-sectional variation of electoral fraud suggests that electoral malpractices were not evenly distributed between Russia's regions. In the election of 2012, for instance, where the average level of fraud is equal to 8.9% that matches a standard of electoral authoritarianism, the estimated amount of fraud in Moscow (fraud = -0.8%, vote = 47.9%), Vladimir Oblast (fraud = -0.7%, vote = 54.2%), and Perm Krai (fraud = 1.0%, vote = 63.8%) worth a good standard of electoral democracy. On the other tail of the continuum of electoral regimes, where electoral competition ends, are located Tatarstan (fraud = 23.3%, vote = 83.3%), Bashkortostan (fraud = 19.2%, vote = 75.9%), and Kemerovo Oblast (fraud = 16.5%, vote = 78.0%) – they are cases of a hegemonic subtype of electoral authoritarianism. Finally, Chechnya (fraud is undefined, vote = 99.9%), Dagestan (fraud = 27.5%, vote = 93.1%), and Mordovia (fraud = 25.0%, vote = 87.6%) are cases of closed authoritarianism where electoral competition is meaningless. The classification of regions based on their level of fraud is in line with the common wisdom regarding the nature of politics in these regions. This empirically confirms that, as theoretically predicted (Greene 2007: 34; Levitsky and Way 2002: 53; Magaloni 2006: 21–23), electoral fraud does not play a decisive role in survival of electoral autocracies. On the example of electoral fraud, this also empirically supports my theoretical expectations concerning the extent of occurrence of illegal practices in different types of political regime presented in the next section.

Media Bias

Besides resorting to fraud and repression, authoritarian incumbents systematically distort the delivery of information to the public. It is shown by Stier (2015) that authoritarian regimes are characterized by significantly lower levels of media freedom. The media in electoral democracies are, however, not absolutely impartial as well. Della Vigna and Kaplan (2007) studied the effect of the introduction of the conservative Fox News Channel between 1996 and 2000 on the vote share change of the Republican candidate in the same period. They found that Republicans gained an additional 0.4 – 0.7 percentage points of the vote in towns with Fox News broadcasting. Gerber, Karlan and Bergan (2009) conducted a field experiment to examine the effect of newspaper reading on the vote. They found that subjects who were assigned Washington Post reading were 7.9% more likely to vote for the Democratic candidate than subjects from the control group and 3.9% more likely to vote for the Democratic candidate compared with those who were assigned Washington Times reading.

Similar effects were found in the studies of Russian parliamentary and presidential elections of 1999–2000. Enikolopov, Petrova and Zhuravskaya (2011) demonstrate that a one standard deviation increase in the probability the NTV (a private media channel) is available decreases the vote for Unity by 1.6% and increases the vote for OVR and SPS by 0.36% and 0.35%, respectively. White, Oates and McAllister (2005: 191) even argue that the elections of 1999–2000 "have been won in large part through the partisan use of (particularly state) television." The authors show that the communist party received more than twice less news coverage by state channels than Unity, the major "party of power", and the main opponent Zyuganov received about four times less news coverage from all sources than Putin. However, out of those who voted for Putin, 67% watched state television and 58% of Zyuganov's voters also watched state channels. The exposure to state television is significantly associated only with the vote choice for Putin (positively) and Yavlinsky (negatively) but not with the vote choice for Zyuganov.

Authoritarian regimes differ from their democratic counterparts with respect to media bias in the fact that political leaders in authoritarian regimes possess much more resources and tools to bias the delivery of information in their favor. Authoritarian leaders can directly control the media through state ownership in which "appointments to key positions are linked to political loyalty" (Becker 2004: 149) or by encouraging friendly businessmen to invest in the media (Gehlbach

2010). They can indirectly control the media as well through tax privileges, subsidized newsprint, and cash payments to journalists (Gehlbach and Sonin 2014) or by applying quasi-legal actions to journalists under the guise of fight against slander and libel that threaten the image of state officials (Price and Krug 2000: 18). Finally, authoritarian incumbents can illegally persecute and torture journalists.

It is worth mentioning that media bias and even outright propaganda have lower costs related to their consequences than electoral fraud or repression. While electoral fraud should be perpetrated in secrecy and political repression should be selective and “dosed” to not entail a backlash in the form of mass protest, riots or a coup, propaganda has much fewer such limitations. Propaganda as a public delivery of false facts and distorted information does not put legitimacy of the incumbent into question as categorically as public awareness of electoral fraud does. Unlike political repression, it does not affect the interests of personal security of social groups. Therefore, it can be repeated time after time until people believe it. Nevertheless, Guriev and Treisman (2015: 4) raise a conceptual question: “the effectiveness of propaganda in authoritarian regimes is a prima facie puzzle. Given that citizens know the dictator has an incentive to lie about his type [of competence], why do they ever listen?” Guriev and Treisman’s answer to this question is that dictators, besides propaganda, sometimes choose to spend their budget on public goods that can be directly observed by the public and convincingly support messages sent by propaganda. This explanation, however, assumes that citizens are absolutely incapable of differentiating between actual outcomes of incumbent’s policies and outcomes declared by propaganda. This assumption is too strong. Consider a citizen who directly observes the state of the economy, healthcare, education, law enforcement, and other public goods in the country. He knows, for example, that consumer goods have become much more expensive in recent years, healthcare and education are becoming of less quality and less affordable, roads are falling apart in many areas of the country, other types of infrastructure are also poorly maintained (the list of examples can be supplemented in contemporary Russia), yet the official television says that the incumbent is *always* competent. Under such conditions, why should this citizen believe propaganda, even if he observes that public goods are *sometimes* actually delivered?

I agree with Guriev and Treisman (2015) that propaganda plays an important role in modern dictatorships. It is beginning to play a more and more prominent role in Putin’s Russia, especially after the military conflict in Eastern Ukraine, when state-sponsored media resorted to pseudo-patriotism as a tool of mobilizing popular support for the regime. However, the question on citizen willingness to adopt false believes remains decisive for understanding the effectiveness of propaganda in authoritarian regimes. It cannot be answered in the current study and deserves further examination. Nevertheless, I offer a preliminary explanation in Appendix F6. Building upon the theory of motivated reasoning, I argue therein that the adoption of admittedly false information delivered by propaganda is associated with lower psychological costs than an objective truth-seeking view on reality. For this reason, authoritarian incumbents can simply redirect responsibility for poor policy performance from themselves to an external enemy (Obama, Americans, the West, etc.) and voters will willingly accept this informational message since there is easier to blame someone else for country's troubles than themselves for supporting the regime and voting for dictatorship.

Political Institutions and Co-Optation

Additionally to "sticks" in the form of fraud, repression, and censorship, authoritarian leaders can also use a "carrot" in the form of co-optation of opposition activists into executive structures of the state or into a dominant party. Gandhi and Przeworski (2007) found that those authoritarian rulers who had fewer legislative parties than there was necessary given the strength of the opposition (underinstitutionalized cases), survived in power for only 3.3 years on average during the 1946–1996 period. In the overinstitutionalized cases, the rulers survived for 9.4 years. Magaloni (2008) argues that autocratic parties mitigate commitment problem by institutionalizing the exchange between the ruler and the elite. Members of the ruling elite know that they will receive spoils and privileges until they are party members; if they decide to split, they lose benefits. Svolik (2012: Ch. 6) argues that parties in autocracies help dictators to solve the problems of power-sharing and control. Geddes (1999)[9], Brownlee (2007), and Boix and Svolik (2013) also argue that parties play a crucial role in longevity of authoritarian rule. Nevertheless, authoritarian dominant parties are not the only institutions to co-opt potential challengers. Arriola (2009) argues that a larger cabinet size allows dictators in African countries to prolong their regime duration by expanding patronage coalitions.

[9] Smith (2005), however, shows that if the USSR and Mexico are excluded from the sample, the positive effect of a single party on regime duration disappears.

This literature, however, underestimates the perils of co-optation and does not clarify that power-sharing by authoritarian incumbents with the opposition can be effectively carried out to a decorative extent only. Opponents cannot be admitted to key positions of policy making, otherwise they would endanger dominance of the incumbent. Studying the effect of political system on political stability in Africa, Kirschke (2007) fund that, consistently with the co-optation theory, pure parliamentary systems have experienced no coups in 1990–2005, whereas the probability of *coup d'état* was higher in pure presidential systems (25% of changes of government). However, a higher risk of coups experienced semi-presidential systems (52% of changes of government), where the head of state have to take the influence of opposition parties in the parliament into account to appoint a prime minister. And the highest risk was observed in extreme cases of power-sharing characterized by a politically divided executive (presidents have to share power with prime ministers from an opposition party), where governments were overthrown in coups with the probability of 83%.

Besides this, two major factors make the co-optation strategy problematic: 1) opposition strength vis-à-vis incumbent weakness, and 2) high degree of ideological commitment of the opposition.[10] Put otherwise, only moderate opposition activists can be effectively co-opted. Those activists who value political program more than office (message-seekers) are more likely to reject the incumbent's offer on co-optation (Greene 2006). Even for office-seekers, co-optation is preferable only as a choice between political extinction and at least some, even minor, office. Otherwise, if the incumbent does not have an overwhelming advantage over the opposition, they would stay in opposition parties. Hence, if the opposition is strong and ideologically committed, it cannot be co-opted at an acceptable cost. This was the case if the Communist Party of the Russian Federation (KPRF). Although KPRF dominated in the parliament in 1995–1999, the Communists were not (and could have not been) offered any significant ministerial portfolios in the government so long as this would imply a policy change, which was unacceptable for Yeltsin.

The situation has changed in the 2000s when the number of opposition parties and their influence in the State Duma substantively reduced. The Kremlin did not have incentives to co-opt KPRF since it lost the credibility of its threat to the regime. At the same time, the political party Rodina (motherland) emerged in 2003 as a coalition of minor parties that received 9.2% of the vote in the 2003 parliamentary

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[10] Similarly, Magaloni (2008: 11–13) suggests that dictators facing strong and highly polarized opposition will find it harder to consolidate a stable party dictatorship.

election. The party adopted increasingly nationalist rhetoric that was persistently not tolerated by the Kremlin (since the 1990s, nationalism is allowed in Russia only in the form of Zhirinovsky's LDPR). As a result, the party was denied of registration in several regional elections. Dmitry Rogozin has had to step down as party leader in 2006. Under the new leadership, Rodina merged with Russian Party of Life and Russian Party of Pensioners, was renamed into Just Russia, and abandoned its nationalist rhetoric. After leaving the opposition activity, Rogozin was appointed (co-opted) a Russian Ambassador to NATO in 2008 and a Deputy Prime Minister of the Russian Federation in 2011. Analogously, another leader of the party – Sergey Glazyev – was appointed a Deputy Secretary General of the Eurasian Economic Community (EurAsEC) in 2008 and an Advisor to the President of the Russian Federation in 2012.

The case of Rodina shows that while its leaders were offered positions in the executive, which is more valuable in Russia than the legislature (see the last section in this chapter for more details in this regard), the rank-and-file members were co-opted into a new loyal party. Very few (if any) opposition leaders were co-opted into United Russia. An increasing rate of governors' membership in United Russia could be deemed as an exception. However, governors are rather "forced into joining the party" (Reuter 2010: 299) than co-opted. They do not receive upper appointments but retain their prime offices (governorships), whereas United Russia's party ballot has about the same legal meaning as Mongolian *jarlig* (a "formal diploma") during the Mongol-Tatar yoke, which authorized the rule of local princes in Rus'.

Stressing the capacity of dominant parties to co-opt opposition leaders and monitor their behavior, the literature assumes the existence of a dominant party as taken for granted, it does not consider whether a dominant party can be feasibly created under a certain type of political regime. In the Russian case, United Russia as the "party of power" was not invented by Putin. Multiple attempts to establish a stable dominant party in the State Duma have been made by Yeltsin's regime, yet all of them resulted in a fiasco. During the 1990s, Yeltsin was backed by several parties that managed to receive only minor shares of the vote: Russia's Choice (15.5%) and the Party of Russian Unity and Concord (PRES) (6.7%) in 1993, Our Home Is Russia (10.1%) and Democratic Choice of Russia (3.9%) in 1995. Two "parties of power" – Unity and Fatherland – All Russia (OVR), which eventually merged into United Russia in 2001, represented different factions of the ruling elite and even competed with each other in the parliamentary election of 1999. The only Putin's institutional invention with respect to the "party of power" was apparently liquidating the dualism of the "party of power" that existed during the 1990s, when at least two parties represented interests of the ruling elite.

Thus, there is a huge discrepancy between intention to create a reliable dominant party and implementation of this idea in practice. Even if dictators would like to create dominant parties to co-opt all oppositionists into them, they cannot do it by decree for several objective reasons. From the perspective of this study, I would offer to change the chain of causality by setting elite loyalty and mass electoral support prior to authoritarian institutions and the possibility to co-opt challengers. Once dictators are capable of securing loyalty of elites and masses, they have more space for maneuver to establish and amend institutions that seem to be the most appropriate for their purposes; if they are not – they are powerless in institution-building.

Legal Restrictions on Competition and Manipulation with Electoral Rules

Another kind of institutional explanation of authoritarian survival refers to electoral engineering, which peruses a goal of skewing legal rules of competition in favor of the incumbent. Earlier studies put forward a hypothesis that the plurality single-member district (SMD) system reduces the number of relevant parties to two, while the proportional representation (PR) system favors a multi-party system (Duverger 1954; Rae 1967). Later studies revealed that not only the type of electoral system but also the number of policy issues (Taagepera and Grofman 1985), electoral formula and district magnitude (Lijphart 1990), social cleavages, district magnitude, district level and other factors (Cox 1997) determine the effective number of parties and the degree of disproportionality. Benoit (2007), however, suggests a reversed causation: not electoral systems determine party systems but rather electoral systems are established under the impact of party competition, societal cleavages, external actors, office-seeking and other interests. Extrapolating these findings to electoral authoritarian regimes, it follows that authoritarian incumbents should be most interested in the adoption of majoritarian electoral systems that favor a candidate that comes first at the polls. Higashijima and Chang (2016) find support for this proposition. In their data set of electoral authoritarian regimes, the average effective electoral threshold decreases from 27 to 20 over time with the grand average of 24 (all values above 10 indicate a majoritarian electoral system and 37.5 indicates the SMD system). Higashijima and Chang estimated that authoritarian parties obtain 3.1% more seats under SMD than under PR systems, on average, whereas this seat premium increases to 8.3% when the ruling party receives 85% of the vote.

While using a majoritarian electoral system for electoral concerns is apparently the basic form of electoral engineering, the manipulative electoral practices are highly diverse. Among others they include highly disproportional electoral formulas for conversion of votes into legislative seats in PR systems, especially the Imperiali and d'Hondt methods (Benoit 2000); manipulation with districting, especially jerrymandering (Erikson 1972; Wong 2017) and malapportionment (Tan and Grofman 2013); restrictions on donations and limits on total campaign spending (Treisman 1998c); restrictions on media advertising, including television time (Holtz-Bacha and Kaid 2006); high deposits and fees candidates have to pay and/or large numbers of signatures candidates have to submit for getting access to ballot (Stratmann 2005); and excessive thresholds in PR systems (Jaklic 2008). This list is far from complete. The extent of manipulation is limited only by imagination of incumbent's advisors and social resistance to their innovations. Additionally to traditionally studied characteristics of electoral systems, Grofman and Lijphart (1986: 2–3) offered a 13-item list of more detailed characteristics to be considered, ranging from suffrage and registration requirements to mechanisms of voter intervention. These characteristics and their political effects, especially with the focus on authoritarian regimes, are unfortunately poorly studied so far.

It should be noted that, likewise media bias, electoral law manipulation can be practiced in electoral democracies and in electoral autocracies as well. In his profound study of electoral rules manipulation by the Liberal Democratic Party (LDP) in Japan, McElwain (2008) argues that the LDP altered campaign regulations approximately fifty times during the postwar period to manufacture its parliamentary dominance.[11] The LDP was unable to replace the multimember district single non-transferable vote (MMD-SNTV) system with SMD system due to the interests of intraparty incumbents and has had to rely upon numerous microlevel changes in electoral rules. These include extremely high deposits,[12] prohibition of advertisements prior to electoral campaign and reduction of campaign duration from 25 days in 1952 to 12 days in 1994, abolishing of door-to-door campaigning, and granting little time for candidates on public television given that candidates were not allowed to purchase advertising time on commercial broadcasts

[11] Scheiner (2006), however, argues that electoral rules played a minor role in sustaining the LDP's dominance, whereas clientelism contributed the most.

[12] If a party wanted to run one candidate in all 129 districts in 1992, it would have to pay a $3.5 million equivalent, which could not be reclaimed if the candidates obtained less than a specified share of votes.

until the 1990s. On the authoritarian spectrum of political regimes, Diaz-Cayeros and Magaloni (2001) show that Partido Revolucionario Institucional (PRI) in Mexico established a mixed electoral system by adding multi-member districts (MMDs) to SMDs in 1977 primarily to discourage coordination between opposition parties and voters, and facilitate, thereby, party dominance.

The argument regarding electoral engineering developed in this study is the same as with regard to political institutions – it plays an important yet secondary role in stabilizing authoritarianism. The Russian political experience confirms this proposition by showing several examples when incumbent's attempts of electoral manipulation failed due to the lack of loyalty of elites or masses. In the 1990s, any such attempts were simply blocked in the parliament, which was controlled by the opposition. For example, when Yeltsin proposed an amendment to State Duma Election Law, which stipulated a change in seats proportion from 225/225 to 300 seats to be elected in SMDs and 150 – under PR, Duma voted against this amendment (Remington and Smith 1996).

In the early 2000s, United Russia obtained a majority in the State Duma that allowed Kremlin's political strategists (Vladislav Surkov, then-First Deputy Chief of the Russian Presidential Administration, was most outspoken of them) to amend electoral legislation considerably. These changes initially occurred at micro level and related primarily to restricting the access of minor parties and independent candidates to ballot. To be registered, a political party was required to have regional branches in over than a half of all regions. The minimal required number of party members in the half of regions was increased from 100 in 2001 to 500 in 2004, and the total minimal party membership was increased from 10,000 to 50,000 in these years, respectively. Accordingly, the number of registered parties has gradually reduced: 44 in 2003, 36 in 2005, 15 in 2007, and 7 in 2012 (TASS 2012). The requirements for registration of a candidate were not less restrictive. Candidates running for the presidential office in the 2000s were expected to submit 2 million signatures, and candidates from party lists seeking Duma mandates – 200 thousand. Parties represented in the parliament and their nominees are exempted from this legal requirement. As a consequence, the number of presidential candidates also decreased over time: 11 in 2000, 6 in 2004, 4 in 2008, and 5 in 2012; as well as the number of party lists in State Duma elections, in these election-cycles respectively: 30, 23, 11, 7.

When Kremlin's political strategists began to enjoy the regime's strength, they proposed a macrolevel electoral law amendment. For reasons of better manageability of regional representatives that were elected as independents (White and Kryshtanovskaya 2011), the SMD layer of the State Duma electoral system was eliminated in 2005. This decision has obviously been premature. In Stalin's terms, it was driven by "dizziness from success" (*golovokruzheniye ot uspekhov*). United Russia received only 37.6% of the vote in the election of 2003 and forged a 68.3-percent majority of seats mainly due to absorption of independents and other parties' deputies into its State Duma fraction (Golosov 2005). Using a Monte Carlo simulation, Smyth, Lowry and Wilkening (2007) estimated that United Russia would gain the support of 45.6% of the electorate and would win a total of 210 seats if the election of 2007 conducted under the PR system. Notwithstanding such expectations, the actual election result of 2007 was favorable for the "party of power" – 64.3%.

The failure of excessive electoral manipulation, however, has become evident when United Russia officially received 49.3% of the vote in the 2011 election (slightly over 30%, according to electoral observer reports (Oreshkin 2011; RuElect 2011)) and the public awareness of fraud has triggered a strong wave of post-electoral protest. The regime has had to admit its excesses due to "dizziness from success" and to roll back several legal restrictions formerly imposed on electoral competition. The amendments of 2012 decreased the minimal party membership to 500 and the number of required signatures to register a presidential candidate – to 300 thousand and 100 thousand – to register a party list for State Duma elections. As a reaction, the number of registered parties jumped to 56 by the end 2013. The number of presidential candidates reached 8 in 2018 and the number of party lists in the State Duma election of 2017 increased to 14. Besides this, gubernatorial elections, which have been canceled in 2004, were reintroduced in 2012 and electoral threshold of the parliamentary PR system was reduced from 7% to its previous level of 2003 – 5%. Thus, electoral engineering is a cartage, not a horse, that brings the leader to authoritarian dominance. What Golosov (2017) calls "authoritarian learning" in the process of development of Russia's electoral system, is rather a confirmation of the fact that authoritarian leaders will have to learn this lesson from their own bitter experience if they put the manipulation with electoral rules prior to the actual balance of power.

The Role of External Pressure

The external political environment is ordinarily viewed as favorable for democracy promotion, especially in the post-Cold War period. Said differently, dictators tend to lose power under the influence of external pressure. One of the first, Starr (1991) has shown the importance of diffusion approaches to the spread of democracy in the world. Studying governmental transitions based on yearly Freedom House data in 1974–1987, he has demonstrated that 31.6% of positive transitions at home were accompanied by positive bordering government transitions in the past two years, whereas only 10.1% of the positive domestic transitions were accompanied by negative bordering transitions.[13] O'Loughlin et al. (1998) presented evidence of temporal clustering (the waves of democracy in Huntington's (1991) terms) and spatial clustering of democratic and autocratic trends. The later studies (see Houle, Kayser and Xiang 2016: 639 for a review) have shown that the proportion of neighboring democracies and a neighboring transition to democracy increase the probability of transition to democracy (Gleditsch and Ward 2006), yet countries "catch" between 8% and 11% of the average change in democracy of their geographic neighbors – much less than the theory of democratic domino predicts (Leeson and Dean 2009), whereas the effect of the change in the share of democratic neighbors on the probability of transition to democracy becomes stronger after authoritarianism has experienced a breakdown (Houle, Kayser and Xiang 2016).

Although the literature on diffusion of democracy finds empirical support for the geographic clustering of democratization, it does not offer a comprehensive examination of international linkages that bond adjacent countries and make diffusion effects possible. Foreign trade can theoretically contribute to establishing such cross-country linkages. Lopez-Cordova and Meissner (2008) show that trade openness (i.e., the value of imports and exports divided by GDP) increases propensity to democracy measured by Polity IV score. Rigobon and Rodrik (2005), to the contrary, show that trade openness has a negative impact on democracy and a positive (yet significant in one specification only) impact on rule of law. Given such sharp discrepancy in the results, the analytical debate cannot be effectively completed only by using different estimation procedures. To establish causality of the effect, studies should theoretically substantiate the relationship between the

[13] The reversed influence, however, was also strong enough. 23.1% of negative neighbouring transitions were associated with negative home transitions and 17.3% of positive neighbouring transitions were associated with negative home transitions (calculations are based on Table 5 in the article).

predictor and the outcome variable and then empirically test the association within and between each link of the theoretical chain. The causal chain, according to Lopez-Cordova and Meissner (2008: 543), is the following: the globalization of trade leads to economic growth and economic growth then leads to democracy. However, as it is earlier shown in the subsection on economic explanations, no strong robust relationship between democracy and economic development was found. Furthermore, in their profound survey of studies on the relationship between trade barriers and economic growth, Rodriguez and Rodrik (2000: 266) conclude that "[t]he issue is far from having been settled on empirical grounds. We are in fact skeptical that there is a general, unambiguous relationship between trade openness and growth waiting to be discovered." Additionally to the weak causal and dubious empirical confirmation, the literature on the relationship between trade openness and democracy does not specify – with whom to trade, with democracies or autocracies.

This shortcoming was corrected by Levitsky and Way (2010). Measuring economic ties, they take into account the extent of trade (exports and imports over GDP) with the United States and 15 EU member countries only. Along with economic linkage, the authors also define five dimensions of "Western linkage" – intergovernmental linkage, technocratic linkage, social linkage, information linkage, and civil-society linkage – each of which is a specific kind of ties to the West. While Western linkage promotes democratization, two factors in the model inhibit it. Incumbent's "organizational power" (state coercive capacity, party strength, and state economic control) allows authoritarian incumbents to effectively resist the external democratizing pressure. "Western leverage" also indicates the extent of vulnerability or strength of the regime vis-à-vis the West. Leverage is low when the following criteria are met: a large economy, a country is major oil producer or possesses nuclear weapons, and a country belongs to the sphere of interests of a major power that is not the EU or the United States. The implications of the theory to Russia suggest that the country was most vulnerable to democratization in the 1990s when its economy and state institutions collapsed, then organizational power enhanced in the 2000s and lowered chances for democratization.

The aforementioned literature positively assesses the external influence on democratization. This is, however, not necessarily the case. During the Cold War, the major superpowers exerted pressure on the third countries and granted them economic assistance conditionally on their systemic commitment to capitalism or socialism. Only after the Cold War when the Soviet threat disappeared, the Western donors began to allocate assistance conditionally on economic liberalization and democratization that has left dictators' patronage networks unfunded. Gibson and Hoffman (2002: 16) argue that "during the Cold War rulers could easily transform external assistance into a resource for patronage. With the end of the Cold War, donors began to provide less assistance generally, and the assistance became imposed with more onerous conditions [...] only countries that demonstrated a commitment to political liberalization received external assistance." Similarly, Dunning (2004) found that a positive effect of foreign aid on democracy in Africa is limited to the post-Cold War period. A significant effect of the Cold War was also found in the study by Wright (2009) with data from 190 authoritarian regimes worldwide.

The role of external pressure is not univocally in line with democratization hypothesis in Russia as well. Levitsky and Way (2010: 187) note that "[d]espite the external vulnerability – and opportunities for Western influence – created by the post-Soviet economic collapse, Russia's economic and strategic importance inhibited Western democratizing pressure." Clarifying this strategic importance, they mention that Russia possesses strategic nuclear weapons, massive oil reserves and it is one of the world's largest suppliers of natural gas. The authors, however, do not formulate explicitly why these factors might inhibit Western democratizing pressure. If they had formulated, the role of the Western pressure would have looked unpleasant. At least two events that might (and probably did) decisively influence the balance of power in most crucial periods of Yeltsin's rule can be mentioned to designate the role of the Western pressure. There can be no dispute that the Western community (primarily the United States) has supported the side of Yeltsin in his military attack on the parliament in 1993 and informationally backed Yeltsin's electoral campaign against Zyuganov in 1996. In particular, Kramer (1996) divulges how a group of American political consultants clandestinely guided Yeltsin's presidential campaign and, along with the implementation of typical yet hitherto unknown in Russia techniques of political campaigning, insisted to change the main topic of campaign from an election on Yeltsin's stewardship in which Yeltsin would lose and lose badly to a referendum on restoration of Communism in which the Communists must be stopped at all costs. A positive (and conventional) view on these events suggests that the West was concerned about the restoration of communism and supported Yeltsin as a "lesser evil".

Notwithstanding, KPRF of the 1990s has not been an analog of the CPSU of the 1970s; even if KPRF can be compared with the CPSU, it would be the CPSU after

Gorbachev's *perestroika*. The hard-core communists were represented by the Russian Communist Labor Party (RKRP) that as a part of an electoral bloc Communists – Labor Russia – For the Soviet Union received only 4.5% of the vote in the 1995 State Duma election and did not have real chances to get into power. KPRF, instead, was a moderately reformed nationally transmuted, though not adopted a social democratic platform, communist successor party (Bozoki and Ishiyama 2002; Sakwa 2002). Similarly to Russia, communist successor parties in East-Central Europe were trying to take electoral advantage of economic crises that hit their countries as a result of radical liberal market reforms. In several cases they successfully managed to defeat incumbents (Orenstein 1998). The alternation of power has rather positively affected democratization in these countries, yet it was blocked in Russia by the West. In response for the Western support, Yeltsin made immense concessions in the reduction of Russia's nuclear weapons and the reforming of the economy toward the Washington Consensus. Thus, the basic assumption of Levitsky and Way's (2010) theory does not hold in Russia. The Western influence was motivated by realpolitik interests rather than by democratization of the country in the 1990.

More recent studies uncover that external pressure may also have a negative effect on democratization due to various forms of authoritarian diffusion (see Soest (2015) for a review). In particular, the MENA countries adopted similar strategies to counteract the spread of the Arab Spring. They raised salaries of armed forces personnel, increased public spending targeted at the poor, and blamed violence on rioters (Heydemann and Leenders 2011). Russia and China responded similarly to color revolutions and the Arab Spring. They publically framed these events as orchestrated by the United States, both countries adopted similar laws that increased restrictions on NGOs (see also Bader (2014) on the spread of election laws from Russia to adjacent post-Soviet states), and elaborated mechanisms of co-opting the youth (Koesel and Bunce 2013). In his case-study of Russia, Ambrosio (2009) argues that Russia under Putin has adopted several strategies of authoritarian backlash against democracy to promote authoritarianism in its neighboring post-Soviet states, especially in Belarus. Moreover, Russia' resistance to democracy, according to Ambrosio, appears to be akin to the past-time confrontation between the Soviet Union and the United States. He notes that "Russia emerged as a principal opponent of democracy promotion globally and its relationship with other like-minded states formed the core of the authoritarian alignment in the international system" (p. 5). Way (2015), however, shows that

Russian foreign policy was driven not by the interests of autocracy promotion as such but rather by economic and geopolitical interests.

Due to the ambiguity of theories of democracy/autocracy diffusion, I do not test their predictions in this study. At any rate, consolidated authoritarian regimes are capable of resisting the external democratizing pressure and even exert their own external influence for autocracy promotion.

A Supply-Side Theory

Although this study is focused on restrictions imposed by authoritarian policies on electoral demand, one influential supply-side explanation of opposition failure in electoral autocracies should be mentioned here. According to Kenneth Greene's insightful argument, dominant-party systems manage to persist for longer periods of time due to their illicit access to resources, derived from the public budget and state-owned enterprises, in order to make opposition parties ideologically radical and unattractive to voters (Greene 2007; Greene 2010). Even though opposition parties in most authoritarian regimes act as niche-oriented competitors, one essential theoretical question arises. If voters do not consider opposition parties as viable alternatives and the probability of alternation of the ruling party in power is dramatically low, why should voters participate in elections at all? Extrapolating Greene's argument regarding opposition elite participation to voters, we should expect that voters, who support ideologically radical opposition parties, also have radical policy preferences and they support their parties as message seekers. However, Greene argues that the majority of voters in Mexico were moderate. It is puzzling, therefore, why do moderate voters support radical opposition parties and (even if they do not support the radicals) why do they persistently vote for the incumbent but do not deny their support from time to time as it happens in democracies or do not abstain?

Furthermore, in his earlier article, Greene (2002: 763) notes that "[t]he dominant party's patronage advantages detailed above make the squeezing strategy electorally suicidal despite its proximity to the median voter in each dimension." In other words, the possibility of political moderation for opposition parties is limited by hyper-incumbency advantages. First, authoritarian incumbents commonly resort to electoral fraud and repression of opposition activists, they deprive the opposition of access to the public media, deny the right of opposition candidates to be registered and run in elections, and use other legal and illegal tolls of dominance.

As a result, as Greene (2007: 39) metaphorically depicts it, the incumbent can speak to voters with a megaphone, while challengers can only speak in a whisper. Second, the credible commitment problem limits the efficiency of ideological moderation. In consolidated authoritarian systems, voters have no prior information on the opposition's economic performance because the opposition has never been in office or ruled the country in another historical context (Magaloni 2006: Ch. 7). Hence, given similar (moderate) policy appeals, voters should rather prefer the incumbent, who is a more prominent and credible option and is additionally capable of supporting his/her policy appeals with patronage benefits.

Finally, it should be noted that hyper-incumbency advantages enjoyed by authoritarian leaders, which allow them to make opposition parties ideologically radical and unattractive to voters, could be impossible without securing elite loyalty. It is not the incumbent president who personally bribes and intimidates voters, falsifies votes, represses opposition activists, and persecutes journalists. In all these and many other authoritarian activities, the incumbent has to rely upon central, regional and local elites. Authoritarian incumbents, therefore, have inevitably to pay for loyalty of the ruling elite, the bureaucracy and other relevant agents. Acknowledging the importance of incumbent strategies toward the opposition (repression, co-optation, marginalization, and a specific type of co-optation that I call "affiliation with the incumbent") but do not dwelling on their examination, this study contributes to the supply-side literature of authoritarian survival by showing in detail how the politicized access to state resources translates into particular authoritarian policy outcomes that create what Greene calls "hyper-incumbency advantages" – primarily electoral fraud and media bias.

Politicized Ethnicity

The ethnicization of politics is many authoritarian countries, especially in Africa, is frequently pointed out in the literature. Posner (2005: 97) notes on ethnic favoritism that "[f]irst learned during the rule of Zambia's first leader, Kenneth Kaunda, the lesson that the President will favor his own ethnic group has become, for many Zambians, an axiom of politics". Posner argues that ethnic-based coalition building succeeds inasmuch as voters expect that elected officials favor members from their own ethnic group in the distribution of patronage benefits and politicians, knowing this, seek to improve their electoral chances by shaping their electoral appeals in ethnic terms. Similarly, Chandra (2007) asserts that voters are biased toward ethnic categorization of politics in a limited information situation and when other policy appeals are not credible. There is also some evidence on the influence of ethnicity on politics in Russia. Turovsky (2005) defines a specific culture of "ethnic peripheries" in the electorate that is characterized by a higher level of "conformist voting" for "parties of power". At the same time, Turovsky notes that the left-wing orientation (voting for KPRF) of the ethnic peripheries (regions with the prevalence of non-Russian population) dominated in the first half of the 1990s, yet "it was coming to naught proportionally to strengthening of regional regimes and establishing their relations with the federal authorities, the transformation of the federal authorities themselves, and the Islamic revival intrinsic to a number of regions" (p. 178). Such "ethnic voting" is puzzling for two reasons. First, it is not a classical ethnic voting so long as voters in the regions do not vote for their co-ethnies at the federal level. Second, it is still unclear why the ethnic peripheries supported the opposition in the 1990s and then turned to supporting Putin and United Russia in the 2000s.

The most of literature on politicized ethnicity just only states the fact that the ethnic cleavage is highly important in many authoritarian countries. However, it does not show explicitly how politicized ethnicity, except ethnic cleansing, translates into authoritarian practices and how it contributes to the strength of authoritarianism. This study looks at ethnicity from a different angle.

Russia is obviously not the case of classical tribalism where political leaders allocate clientelist benefits and voters with elites deliver their support along ethnic lines. Putin (as officially asserted) is Russian. An attentive observer cannot notice that the government, the State Duma or other state institutions are dominated by members of a particular ethnic group. Rather on the contrary, Putin and state-controlled media often underline that Russia is a multi-ethnic country (*mnogonatsionalnaya strana*) with over than 180 ethnic groups in which any expressions of ethnic-based nationalism are unacceptable. Moreover, a multi-ethnic character of Russia's people is enshrined in the preamble and Article 3 of the constitution; the creation of ethnic-based parties was prohibited by the electoral law in 2001 and this legal prescription is enforced in practice. In this connection, the initial expectation of this study was that ethnicity does not play any considerable role in sustaining the authoritarian dominance. However, the results show that politicized ethnicity plays much greater role than it might have been expected.

To understand this role, one should recall the Soviet-style model of multicultural state-building that Slezkine (1994) metaphorically called a large "communal apartment" in which ethnically-based republics and autonomous provinces represented separate rooms and Russia was something like corridor and common kitchen where all major decisions were made. The RSFSR remained an amorphous "everything else" that incorporated institutions of the USSR, yet it did not have major institutions established in other republics, including the local communist party, which was founded only in 1990. Such Soviet model of multiculturalism did not originate directly from Marxism,[14] it was rather inspirited by Bolsheviks' own vision of the national question. The "chronic ethnophilia" of the Soviet regime had a purpose to compensate all non-Russians for the long history of Russian "great-power chauvinism" by granting them the right of "self-determination" and, consequently, their own territories, bureaucracies, mother-tongue education, ethnic intelligentsia, and economic resources. Simply speaking, the Bolsheviks intended to do away with historical Russia as a "prison for peoples" by transferring power and resources to all non-Russians (*natsmeny*).

While the Soviet Union collapsed, the Soviet model of ethnic politics continues to persist within Russia, yet not so much for ideological, rather for pragmatic reasons – it yields authoritarian support to the regime. The analysis of federal transfers in Chapter 5 shows that the ethnic regions (i.e., having the constitutional status of republics or autonomous *okrugs* and containing considerable fractions of "titular nationalities" in their ethnic makeup) still continue to receive more benefits from the federal center. Furthermore, such economic rewarding is contingent on higher levels of the federal presidential incumbent's vote typically observed in these regions in Putin's era. However, as Chapter 5 reveals, the high levels of the incumbent's vote in the ethnic regions is the outcome of electoral fraud rather than sincere vote. Chapter 6 offers an explanation to this phenomenon by showing that, first, central transfers tend to be allocated more in favor of elites than voters from 2000 through 2012, and second, central transfers have a strong positive effect on electoral fraud but do not significantly influence sincere vote.

[14] Marx and Engels noted in their Manifesto of the Communist Party: "[n]ational differences and antagonism between peoples are daily more and more vanishing, owing to the development of the bourgeoisie, to freedom of commerce, to the world market, to uniformity in the mode of production and in the conditions of life corresponding thereto. The supremacy of the proletariat will cause them to vanish still faster." In contrast, the Bolsheviks deepened differences between peoples that inhabited the Russian Empire by raising these differences from ethnic to the national level.

Thus, in this study, I generally argue that politicized ethnicity has had an additive aggravating effect on electoral authoritarianism in Russia. It appears to be conducive to electoral fraud and other authoritarian practices. At the same time, it is important to note that the role of politicized ethnicity under electoral authoritarianism cannot be understood independently from distributive politics. In the early 1990, when economic resources and political influence of the federal center shrank dramatically, Yeltsin offered (primarily ethnic) regions to "take sovereignty as much as you can swallow". The ethnic regions in response began to challenge the incumbent in the electoral field and play the card of ethnic separatism in order to bargain more benefits from the center (Treisman 1997; 1999). In the 2000s, when Putin came to power, the ethnic regions were offered another deal – political loyalty in exchange for economic benefits – and they contributed a lot to the process of consolidation of electoral authoritarianism. Hence, politicized ethnicity creates a strong and temporally stable constituency, which can be of pro- or anti-incumbent character. The establishing of such a distributive scheme in which material rewards are contingent upon political loyalty is decisive in whether politicized ethnicity will sustain or undermine authoritarianism.

Distributive Politics, Patronage, and Clientelism

The last approach discussed in this section but most important for the study, which may account for authoritarian survival, refers to distributive politics that manifest itself in multiple forms. These forms include pork-barrel politics (Ferejohn 1974; Evans 2004; Golden and Picci 2008), patronage (Shefter 1977; Calvo and Murillo 2004; Smith and Bueno de Mesquita 2009), clientelism (Kitschelt and Wilkinson 2007; Scheiner 2006; Lust 2009; Hicken 2011; Muñoz 2014; Zarazaga 2014), private goods provision (Bueno de Mesquita et al. 2003) and can be generally called redistributive politics (Cox and McCubbins 1986; Lindbeck and Weibull 1987) or distributive politics (Blaydes 2011; González and Mamone 2015; Luca and Rodríguez-Pose 2015), and sometimes termed "vote buying" (Magaloni 2006; Stokes et al. 2013, Nichter 2014; Kramon 2017). The common denominator of these studies is a premise that the distribution of material benefits is contingent upon political loyalty of its recipients.

This literature, however, has two shortcomings. First, it does not differentiate between the contingent distribution of benefits in democracies and autocracies. In this study, I argue that, unlike democracies, distributive politics in autocracies is twofold: not only the allocation of favors is targeted at voters to influence their votes, but also authoritarian incumbents deliver benefits to elites in order to secure their loyalty. Second and interrelated with the first, the literature does not draw a clear distinction between the distribution of goods aimed to secure loyalty of political elites and the distribution targeted at voters. Differentiating between these two distributive strategies is important since they imply different logics of incumbency survival. While the voter-favorable distribution influences survival of the incumbent by producing sincere voting and increasing, thereby, the level of popular support for the incumbent, the elite-favorable distribution in authoritarian settings entails various intrinsically authoritarian practices, such as electoral fraud, political repression and the persecution of journalists. Later in this chapter, I return to overviewing the literature on patronage/clientelism and discuss these logics of authoritarian survival in more detail. Findings of this dissertation suggest that elites receive much more benefits from Putin's regime in Russia than voters. Although the allocation of federal transfers to the regions appears to be conditional on the level of electoral support of the incumbent (as it might be observed in several electoral democracies as well), not voters but primarily regional elites extract profits from the transfers. In response, regional elites supply the central incumbent with electoral fraud and implement other authoritarian policies that give strength to authoritarianism and allow the incumbent to retain power.

Sources of Incumbency Advantage in Democratic and Authoritarian Regimes

The centrality of informal institutions is asserted to be a distinctive characteristic of competitive authoritarianism (Levitsky and Way 2010: 27–28). However, as follows from the previous section, many tools of political survival have a mixed usage. Gerrymandering and a biased delivery of information by the media, for example, can be equally observed in democratic and authoritarian regimes. This section aims to delimitate democratic and authoritarian practices. In doing this, it offers a simple criterion, namely, that authoritarian practices are typically considered to be illegal. It also shows that the combination of practices entailing a bias of the electoral playing field and the intensity of their usage vary by type of political regime. This differentiation is presented in the section primarily to outline the role of legal and illegal practices (that can be also understood as formal and informal institutions)[15] in electoral authoritarian regimes, the class of regimes to which the object of study belongs to. It must be underlined that this section discusses only practices associated with the bias of the electoral playing field. In a situation of perfect competition, candidates generally draw their electoral advantage from good policy performance (economic voting is an example of this kind). By contrast, legal and illegal practices of imperfect competition yield incumbency advantage independently from policy performance or voter preferences.

Discussing distinguishing characteristics of vote buying, as opposed to distributive politics, Schaffer (2007: 6) points out that "[v]ote buying often runs counter to legal norms. While pork and allocational policies are the stuff of lawful democratic politics, and patronage has nebulous legal status, vote buying is almost always illegal". At the same time, although authoritarian incumbents do not hesitate to resort to various unconstitutional practices or outright abuse of the law to bolster their dominance, legislation in most of the authoritarian countries is also skewed by design against the opposition.[16] However, the set of legal tools that allow

[15] Informal institutions are understood herein not in a traditional sense as unwritten rules or constraints (North 1990: 36–46). Although informal institutions are in fact unwritten, I suggest that their defining characteristic is particularism. Namely, informal institutions are rules that regulate behavior of a particular group of actors on specific issue, whereas the behavior of all other actors on this issue is formally regulated by other rules. In a sense, informal institutions are *status in statu*, they establish rules for "chosen ones" *within* rules for everyone else. For example, the first article of the federal law 19-FZ "On Elections of the President of the Russian Federation" states that "the President of the Russian Federation is elected by citizens of the Russian Federation on the basis of universal, equal and direct suffrage by secret ballot" – this formal rule is applied to all Russian citizens who seeking for presidency. In practice, various types of electoral fraud, as informal institutions, subvert this formal rule. Thereby, the interaction between formal and informal institutions creates a "nested game" (not exactly in Tsebelis's (1990) sense): while opposition actors who are not capable of perpetrating electoral fraud or are predisposed against this practice for moral reasons have to compete in elections under the formal electoral law, the incumbent and the ruling elite create particularistic rules for themselves in order to take advantage. These rules differ drastically from the formal prescriptions and stipulate a system of exchanges (benefits – loyalty – fraud – benefits), which is examined in more detail in this study. At the same time, however, the incumbent and the ruling elite do not rely exclusively upon informal institutions (electoral fraud in this example), they have also to play under the formal rules, that is, hold elections, participate in electoral campaigning, deliver speeches to voters, etc.

[16] Consider registration of candidates for regional legislatures to partly describe the situation in Russia. Regional elections are mainly held under a mixed electoral system, which combines proportional representation for party lists and the majority principle in single member districts (SMDs). The treatment by electoral commissions differs dramatically between opposition candidates and those of the ruling party. Out of 1727 United Russia-backed candidates who applied for registration in SMDs across 83 regional races in the period from 2007 to 2012 only 33 or 1.9 percent were denied of registration. Electoral commissions were considerably less tolerant of candidates of the three opposition parties that were represented in the State Duma (the Communists, LDPR, and Just Russia), which I call "affiliated" with the incumbent opposition: 322 (8%) out of 4023 were not registered. And in a sharp contrast with United Russia and the affiliated opposition, from the total of 4157, 1839 candidates (44.2%) who applied from other parties or as independents (and thereby may be referred to as "true opposition") were not allowed to participate in the elections. It can be roughly calculated that the vote share of United Russia's candidates in SMDs increases by 12.5 percent (from 79.6% to 92.1%) if the proportion of non-registered true opposition candidates shifts from its minimum of 7.7

the electoral playing field to be skewed in favor of the incumbent is employed not only in authoritarian regimes, it is also endemic in electoral democracies. The typology of legal vis-à-vis illegal incumbent practices is presented in Table 1.1.

Table 1.1. Legal and illegal incumbent practices to tilt the electoral playing field

Institutions/ Actors	Practices	
	Legal	Illegal
Elections	Restrictive Electoral Code	Electoral Fraud
Parties	Restrictive Legislation, Biased Public Funding,	Coercion of Businessmen to Donate the Incumbent or to Forgo Funding the Opposition
Media	Media Owners are Affiliated with the Incumbent	Journalists are Bribed, Intimidated or Assassinated
Elites	Clientelism, Pork-Barrel Projects	Elite Corruption, Bribary
Voters	Patronage, Social Spending With Partisan Bias	Vote Buying, Voter Intimidation
Opposition	Co-optation	Repression

Let's take elections as one of the most important institutions to clarify the use of illegal practices in different types of political regimes. I suggest the following criteria. In fully competitive democracies electoral fraud is absent. In electoral democracies fraud is sporadic and small in quantitative terms (let's say, not more than 5% of the vote). In competitive authoritarian regimes fraud is a common place; it is widespread, essential for regime survival but not outcome-changing. In closed authoritarian regimes fraud is outcome-changing and electoral competition is thereby meaningless.

percent to its maximum of 88.5 percent (calculated by the author based on the data taken from the official website of the Central Electoral Commission: cikrf.ru). There is a question however as to the extent to which the electoral commissions' bias is determined by legal norms. Conventional wisdom suggests that the formal requirements for registration are so strict that the status of a candidate can be suspended due to minor errors and misprints in collected signatures or other documents. Nevertheless, electoral commissions may arbitrarily interpret these norms or outright falsify the expertise as a last resort.

At the same time, it should be noted that the amount of fraud and its consequences for power-sharing do not necessarily coincide. For example, we may consider the case of Ukraine of 2004, an electoral democracy where both sides – government and opposition – were engaged in electoral malpractices (Myagkov, Ordeshook and Shakin 2005: 116; Myagkov, Ordeshook and Shakin 2007: 231) and where one candidate won with a slight margin. In such competitive but not consolidated regimes, a marginal fraud in the range from 3 to 5 percent can be outcome-changing. I consider that in similarly doubtful cases theoretical priority should be given to the *meaningfulness* of electoral competition. Therefore, if in a presumed electoral democracy there is sufficient evidence to conclude that the election had been stolen by one party, which had resorted to sporadic marginal and small-scale fraud, then the regime should be treated as electoral rather than closed authoritarian.[17]

Legal practices are also used by incumbents for purposes of competition restriction in different types of regimes. Addressing the same example of elections, I may suggest that excessively restrictive electoral legislation is absent in full democracies but considerable in electoral democracies. In competitive authoritarian regimes, restrictive laws for participation of opposition forces are as essential and widespread as electoral fraud. Finally, in closed authoritarian regimes formal restrictions are generally not so prominent as illicit practices, yet they are still considerable. Again, it should be noted that the proposed relationship is typical but it does not encompass all cases. For instance, in absolute monarchies there is no such necessity to resort to illegal tools since they are based on traditional legitimacy. Table 1.2 sums up the described combination of incumbent practices to bias the electoral playing field by regime type.

[17] Nevertheless, it cannot be defined as an electoral democracy without a flaw. This hybrid resembles democracy in its competitiveness but essentially (in terms of who governs) this is authoritarianism.

Table 1.2. The combination of incumbent practices to tilt the electoral playing field by type of political regime[18]

Practices	Regime Type			
	Full Democracy	Electoral Democracy	Electoral Authoritarianism	Closed Authoritarianism
Legal	No	Considerable	Widespread	Considerable
Illegal	No	Sporadic	Widespread	Overwhelming

Several theoretical implications follow from the table. Electoral authoritarianism combines a widespread use of legal and illegal practices by incumbents. Consequently, electoral authoritarianism cannot be sustained only by means of illegal practices such as voter coercion and vote buying since in such a case voter preferences would be ultimately neglected and electoral competition would be accordingly meaningless. This condition, however, is violated in several studies. Correctly highlighting that repression is not decisive for survival of electoral autocracies, Magaloni (2006), at the same time, attributes the basis of electoral behavior primarily to what she calls "punishment regime" and the "politics of vote buying". Such argumentation is conceptually misleading since it virtually leaves no room for sincere voting. Other studies do also exaggerate the role of electoral fraud under electoral authoritarianism, even though this exaggeration is more conceptual than empirical (see the subsection Clientelism and Vote Buying in this chapter). Thus, the legal practices designed to bias the electoral playing field should be examined in electoral authoritarian regimes not less attentively than the illegal practices and ideally there should be examined a combination of the both. This study shows an interaction between formal and informal institutions in Russia, specifically, the distributive politics of federal transfers appears to be interdependent with the politics of electoral fraud: federal transfers are allocated by the central incumbent to the regions using election results as an indicator of loyalty of regional elites; and regional elites, in response, supply the incumbent with electoral fraud as a substitute of the incumbent's vote in order to receive larger transfers.

[18] In this classification, I rely on the classification proposed by Diamond (2002) with two minor modifications. I exclude the category "ambiguous regimes" and classify "hegemonic electoral authoritarian" regime as a less competitive sub-type of electoral authoritarianism.

What Are and What Are Not Patronage/Clientelism, and How to Delimitate Them?

There is an old tradition of treating clientelism as a kind of distribution of benefits contingent on political loyalty (Shefter 1977; Kitschelt 2000; Hicken 2011; Stokes et al. 2013). This section, however, argues that the recent literature on clientelism has two shortcomings. First, by attributing too much weight to incumbent's capacity of monitoring electoral behavior and stressing the conditionality of a direct exchange of the vote for particularistic benefits, the literature virtually equates clientelism to voter intimidation and vote buying. I argue that these both informal practices pertain to electoral fraud but not clientelism. Second, if formal practices of politically contingent distribution are considered, the literature falls short of demonstrating a difference in mechanisms and effects of these practices between democratic and authoritarian regimes. Inasmuch as various authoritarian practices, such as electoral fraud and political repression, are considered independently from distributive politics, the reasons for occurrence of these practices appear to be unexplained. Put otherwise, one part of the literature is focused on voters and interprets clientelism as vote buying (Magaloni 2006; Nichter 2014), whereas another part of the literature stresses the importance of preferential access to state offices and associated spoils by regime insiders (Bratton and Van de Walle 1997) and private goods provision toward the winning elite coalition (Bueno de Mesquita et al. 2003), yet this literature does not examine the relationship between distributive politics and its authoritarian outcomes. In this section, I explain that both elite-oriented and mass-oriented distributive strategies are substantial for electoral authoritarianism. In the prior section, it was formulated that both formal and informal practices are widespread under electoral authoritarianism. While vote buying and elite corruption are informal practices, this section argues that patronage and clientelism to be formal practices targeted at securing mass and elite loyalty, respectively.

Clientelism, the Nature of the Goods, and Monitoring

Kitschelt and Wilkinson (2007) define patronage as a direct contingent exchange of the vote in return for goods of two particular classes – private goods and club goods. They also highlight three characteristics of patron-client exchange: contingent direct exchange, predictability and monitoring (p. 9). The authors argue that private goods facilitate satisfaction of these conditions inasmuch as private goods can be easily granted and withdrawn if voters defect to the opposition. This predictability, coupled with monitoring of electoral behavior, binds voters to their commitments. Moreover, public goods, according to Kitschelt and Wilkinson (2007: 11), can by definition not be subject to clientelistic exchange: "[w]hereas the provision of private goods through political exchange invariably signals the existence of clientelism, public goods that are desired by everyone in society and from whose enjoyment no one can be excluded, regardless of whether they contributed to the production of the good or not, can by definition not be traded through clientelistic exchange."

However, the point of view on the nature of goods as a determinant of clientelism has been challenged. Stokes (2009: 11) notes that "just as targeted benefits may be programmatic, public goods may be non-programmatic". In fact, unemployment insurance and pensions in modern welfare states are programmatic yet targeted. Weitz-Shapiro (2012: 569) points out that "[f]ood stamps are clearly private goods by any definition of the term. Yet without knowing how a food stamp program is administered, it is impossible to say whether it should be classified as clientelism. Recipients may be chosen on the basis of need alone, or they may believe that their continued receipt of benefits is contingent on their political behavior". This counter-argument can be supplemented by an analogy regarding club goods. Although schools, hospitals and roads cannot be targeted at particular voters, their allocation can obviously be determined by political interests rather than by concerns of social need. Furthermore, even though club goods cannot be targeted at individuals, they can be targeted at various geographic localities (such as communes, provinces, cantons, counties or states) that vary by their level of political support for the incumbent government.

Even public goods, which are delivered to the entire population, do not unambiguously stave off clientelism. First, Kitschelt and Wilkinson (2007: 11) give examples of public goods that pertain to valence issues (i.e., public opinion is heavily skewed rather than divided on these issues): external and internal security, macroeconomic growth, full employment, low inflation, and a clean environment. Such goods are in fact generally non-excludable in nature. Position issues, in contrast, tend to divide the electorate. Therefore, a considerable fraction of voters is by definition cut off of eligible recipients of public goods on these issues. One example of position issue is free-market versus protectionist policy. Politicians may reasonably set various barriers to external competition (tariffs and duties) and provide subsidies for a sector of industry or agriculture in order to give it rise and become more competitive; they may support agriculture and high-tech industry due to concerns of security – to make the country less dependent on the foreign supply of these goods in crucial periods; they may even support small-size agriculture (farmers) to promote employment in the rural area. Nevertheless, self-interested politicians may also implement these policies in exchange for votes. Kitschelt and Wilkinson (2007: 13) give an example of the Fifth Election District in Gunma, Japan the local economy of which relies heavily on the yam industry that survives primarily because of the government's 990 percent tariff on imports. Kitschelt and Wilkinson note that people in the district have voted overwhelmingly for the Liberal Democratic Party, which has offered strong support for the yam industry, and define such delivery of a club good (the yam tariff) as a clientelist practice. The authors, however, do not specify whether the Fifth Election District in Gunma is an exception from the policy of protection of the yam industry or the entire policy is designed so to deliver benefits to electorally loyal districts.

Second, in practice, public goods pertaining to both position and valence issues are aggregate outcomes that can be decomposed into several sub-policies associated with club or even private goods. Considering the concerns of security, politicians may prefer to wage war against the less politically loyal region (the case of Chechnya) and allocate larger central transfers to regions demonstrating separatism at the margin (Treisman 1996; 1997: 247). In a similar vein, the higher local averages of economic growth relatively to the grand average (macroeconomic growth) can be purposefully directed to those areas where the level of the incumbent's support is higher – to oil-producing regions by levying relatively lower taxes or in electorally supportive regions by channeling larger transfers. The national level of unemployment can be decreased by creating jobs in most supportive localities; the level of inflation can vary be sector of the economy depending on the structure of the electorate in the sector, environmental projects can be distributed as pork-barrel projects[19] (Dahlberg and Johanson 2002), population growth can be provided by means of migrants attracted to less supportive of the incumbent areas, and so on. Thus, the nature of goods delivered can hardly be a hallmark of clientelism. All types of goods can be distributed programmatically and clientelistically as well. In the first case, eligibility of the

[19] Bueno de Mesquita et al. (2003: 31) note on this point: "[a]ntipollution policies have a public-goods character to them in that everyone breathes the same air or drinks the same water. Yet antipollution policies also have a private-goods side. Some businesses or industries bear a heavier burden in literally cleaning up their act than do others. This differential burden could be used as a political instrument to punish firms or industries that are not supporters of the incumbent while benefiting those that are."

recipient of goods is determined by explicitly formulated rules resulted from party political platform; in the second case it is contingent upon political loyalty.

The role of incumbent's monitoring of voter choice has been revisited in studies stressing the informational effects of clientelism. Muñoz (2014) argues that electoral clientelism is widespread in Peru in the absence of a strong political organization that could monitor how citizens vote. Based on evidence from focus groups and survey data, she shows that voters do generally not believe that monitoring their vote choices is feasible. Instead, participants of focus groups reported that candidates signal their electoral viability by delivering benefits: "[w]here you find the best food, the candidate is the strongest" (p. 94). In his study of electoral brokers in Argentina, Zarazaga (2014: 38) makes even a stronger claim: "[a]lthough 22 brokers acknowledged that they stole other party ballots from the polling stations, and 12 even admitted to paying certain clients with illegal drugs, none of them reported monitoring individual votes." It is not monitoring that assures voter compliance but the broker's reliable reputation for accessing resources. If clientelist relationships are not a single-shot game (as vote buying), a stable long-lasting delivery of goods makes it possible to gain loyalty of clients. As one broker declared, "if you do not fail them, they are happy to support you. I have people who come before the election asking for the ballot because they want to vote for my candidate. This is because I have been helping them for years and they know I will continue to do so" (p. 39).

Clientelism, Voter Intimidation, and Vote Buying

Although private goods and monitoring of electoral behavior are not relevant for clientelism, they are in fact good preconditions for voter intimidation and vote buying. In several studies, these informal practices are used synonymously with the term clientelism. Magaloni (2006: 20) argues that a hegemonic party's mass support, besides economic growth, electoral fraud, and repression, depends on a "punishment regime" or the autocrat's threat to exclude opposition voters and politicians from the party's spoils system. Since voters are making their choices under the threat of losing an existing benefit, rather than being offered something new, this mechanism resembles voter intimidation. This mechanism is also supplemented by the "politics of vote buying" (Ch. 4). Other studies explicitly narrow down clientelism to vote buying. Stokes, Dunning, Nazareno and Brusco (2013: 7) use vote buying as a sub-type of clientelism, namely, vote buying is clientelism directed at voters. Nichter (2014: 316) defines clientelist vote buying, as opposed to legislative, non-excludable, and non-binding vote buying, as "the distribution of rewards to individuals or small groups during elections in contingent exchange for vote choices". Gans-Morse, Mazzuca, and Nichter (2014) distinguish four strategies of electoral clientelism (i.e., strategies that exclusively involve the distribution of benefits during electoral campaigns) used by clientelist parties (or political machines): vote buying, turnout buying, abstention buying, and double persuasion. Hidalgo and Nichter (2016: 438) specify that "[s]tudies of clientelism should investigate whether rewards are used to induce fraud, lest they misinterpret why some machines distribute benefits." Kramon (2017) equates vote buying to "electoral clientelism".[20]

This literature, however, tends to underestimate costs and limitations of vote buying as a tool for long-term authoritarian dominance. According to anecdotal and empirical (Schedler 2002) evidence, intimidation or the combination of blackmail with vote buying, where the provision of goods is strictly dependent on electoral outcomes, is perceived negatively by the voters. Muñoz (2014) shows that voter intimidation does not have a desired effect in Peru: out of 9.7% of respondents who were reportedly threatened with being removed from a job or social program if refused to support the candidate, 41.5% answered that they would defect if a candidate offered them a benefit in exchange of the vote and 38.5% would reject the offer. Zarazaga (2014: 29) shows that even brokers are well aware that clientelism in the sense of vote buying is illegitimate and it undermines broker's reputation: "[y]ou have to help the poor but be careful not to make it look like clientelism. Nobody likes being used." Weitz-Shapiro (2012) distinguishes two mechanisms – a moral and a self-interested one – that determine rejection of such form of clientelism. She argues that apart from the rejection on moral grounds, middle-class voters might reject election-related handouts inasmuch as it they might view them as a negative signal regarding the quality of government.

For several theoretical reasons, clientelism should be distinguished from vote buying. First, as it was noted earlier, vote buying is illegal, whereas patronage and clientelism are mainly legal practices (Schaffer 2007: 6). Second, vote buying is typically a short-term singular transaction limited in its timing by election campaign or by election day alone. By contrast, clientelist exchanges have long-term character that makes possible forging long-lasting electoral coalitions. As

[20] In particular, Kramon (2017) converts the statement by Schaffer (2007: 16) "Vote buying is still very much a black box of comparative politics" into "As a result, electoral clientelism largely remains "a black box of comparative politics"" (p. 17).

Kitschelt (2011: 7) points out, “equating clientelism with “vote buying” is analytically misleading, at least if vote buying is interpreted as a “spot market” single-shot contract between a buyer and a seller for the fully operationalized transaction of a single vote in a single election, with payment delivered before the vote is cast.” In the other place, pointing out that in many systems patrons directly purchase clients’ votes in exchange for money, Kitschelt and Wilkinson (2007: 19) note that “[m]uch more frequent than single-shot transactions of this nature, however, are webs of exchange, obligation, and reciprocity sustained over a longer period, in which patrons provide *private goods* or *club goods* to their clients.” Third and perhaps most important, vote buying implies a strictly contingent exchange of the vote for material benefits (see literature overview in Nichter (2014: Fig. 2)), therefore, it leaves no room for sincere voting. An earlier quoted confession of electoral broker by Zarazaga (2014: 39) shows that the delivery of goods that is not strictly conditional on voter choice allows to convince the voter to support the candidate rather than vote against preferences.

If the incumbent is capable of monitoring the electoral choice and the receipt of benefits is strictly conditional on the individual’s vote, I treat such cases as vote buying or voter intimidation. Both these practices essentially and juristically (Donsanto 2008: 22) fit the definition of electoral fraud but not of patronage or clientelism.

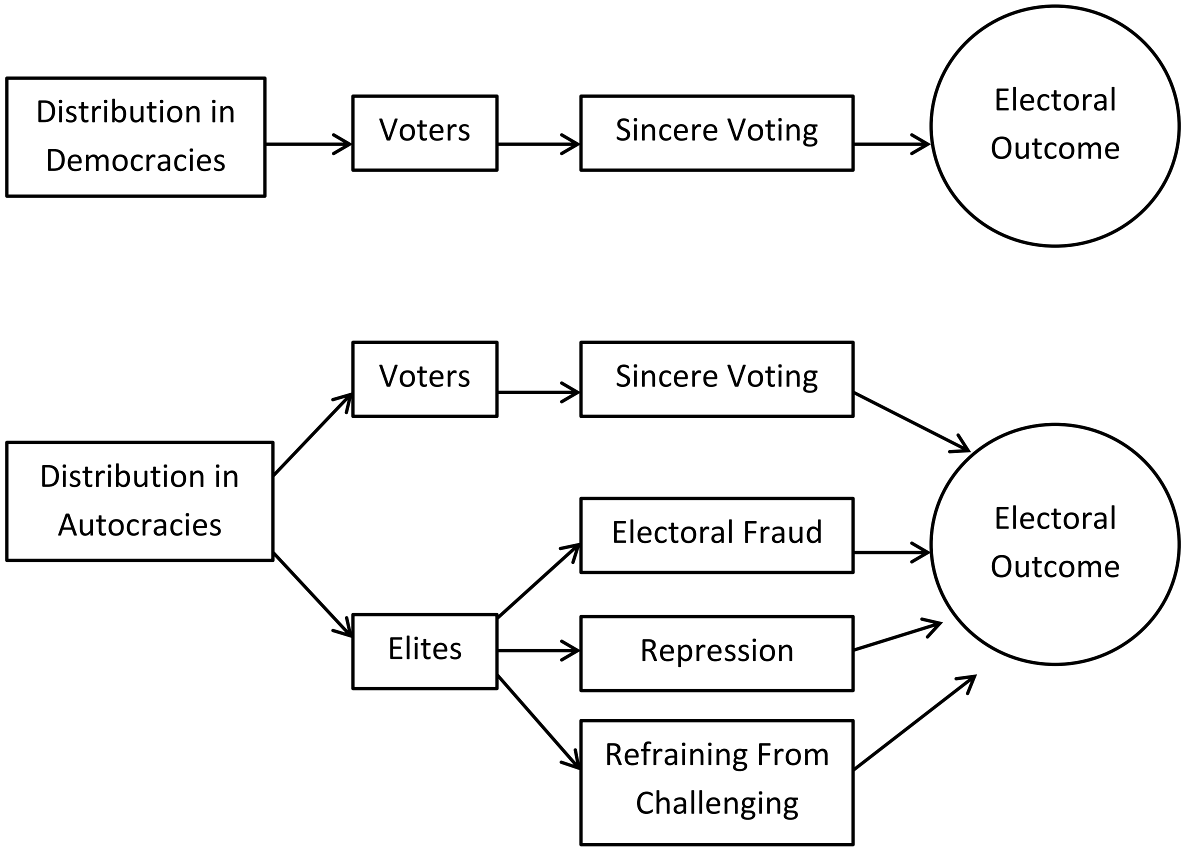
Clientelism in Democracies and Autocracies

It generally follows from the literature that the phenomenon of politically motivated distribution is well-studied in both democracies and autocracies, yet the previous research has drawn no conclusions concerning the intrinsic difference in the distributive politics of democracies vis-à-vis authoritarian regimes (see a literature overview in Chapter 5).[21] Moreover, so long as the politically motivated distribution was initially explored under democratic settings and findings of these studies were extrapolated to authoritarian countries afterwards, the evidence presented by studies of authoritarianism may seem inconclusive. If the distribution in democracies does not differ from the distribution in autocracies, we should observe

[21] As an exception, Magaloni (2006: 68) notes that “[a] key difference between clientelistic practices in “competitive” and “noncompetitive” electoral systems, however, is that opposition voters are invariably punished when only one party governs for decades.” Then she continues that “[t]he introduction to this book makes explicit that noncompetitive systems also exist in democracies” – the Christian Democrats in Italy and the Liberal Democrats in Japan. Given the similarity of clientelistic practices, it is puzzling, however, why have electoral fraud and political repression not been as widespread in Japan and Italy as in Mexico?

that either the distribution in democracies entails the same authoritarian outcomes, as described in the literature on authoritarianism, or the distribution in autocracies does not create sufficient incumbency advantages to make and maintain the regime authoritarian.[22]

Figure 1.1. The distributive game in democracies and autocracies



However, the crucial distinction exists. In democracies, as shown in Figure 1.1, the distributive game is played primarily, if not to say solely, for winning votes. Even though political elites in democracies (first of all, legislators) are engaged in competition over various pork-barrel projects and they do it on their own incentive or as intermediaries on behalf of their party, the final purpose of the distributive game is the number of votes gained in particular districts affected by pork-barrel projects. Ferejohn (1974: 49–51) distinguishes three reasons why such projects are valuable to members of Congress. First, pork-barrel projects as a kind of

[22] There could be an alternative explanation suggesting that distributive politics and authoritarian practices are unrelated. In this case, electoral fraud, repression and other authoritarian policies are implemented by political elites and local agents for non-material concerns, such as ideology (repression of the class of bourgeoisie by the Marxists) or socially irrational behavior in Weberian sense (doctor Josef Mengele under the Nazi). Although these explanations are helpful in explaining mass terror in totalitarian regimes, they are largely irrelevant in electoral autocracies.

constituency service give ground for electoral campaigning. Second and related, paying attention to constituents with regard to the projects makes members of Congress more competitive compared with their challengers. Third, members of Congress can use pork-barrel projects to buy leeway for their activities on more important issues in Congress. Evans (2004: 5) summarizes that "pork barrel politics occurs because members of Congress believe that district benefits enhance their chances for reelection."

In autocracies, by contrast, the official incumbent's vote, apart from some share of sincere votes, consists of noticeable portions of forged ballots and generally bears the seal of unequal competition. In electoral democracies incumbents may face strong challengers emerging from big business, region-level elites (e.g., governors), opposition parties and other spheres of society. In electoral autocracies all independent forces who dare to put the dominance into question run the risk of being exposed to systemic repression, whereas only joining the incumbent's coalition opens the way to power without paying additional costs. Hence, all relevant actors are typically swept into the dominant party if the political system is party-based or in the incumbent's "party of power" if the regime is essentially personalist, they are co-opted into the executive or affiliated with the incumbent in any other way.

All these intrinsic authoritarian policies are carried out by political elites, not by the incumbent personally. However, the authoritarian policies as any kind of policy require tapping resources. Besides that, the ruling elite bears a risk of potential criminal prosecution, especially if the incumbent will be ousted. The system would not work if someone does not pay and the others do not receive benefits of it. In particular, Rundlett and Svolik (2016: 181) underline that "the incumbent does not engage in fraud directly but instead depends on the illicit collaboration of a large number of local agents who must be motivated by the promise of a reward." Thus, by the nature of the regime, authoritarian incumbents have inevitably to deliver benefits for the elites in order to buy their loyalty, which is eventually converted into electoral fraud, repression of the opposition forces, persecution of the media, and refraining from opposing the regime electorally or by any other means. The authoritarian distributive game, which is summarized in Figure 1.1, thereby, aims not only at the maximization of votes but also at the maximization of authoritarian dominance.

Patronage and Clientelism or Two Types of Contingent Distribution

The most of studies use terms of clientelism and patronage interchangeably (Kitschelt and Wilkinson 2007: 7; Bratton and Van de Walle 1997) or use patronage in a narrower sense as delivering of public jobs in exchange for loyalty (Calvo and Murillo 2004; Remmer 2007). Alternatively, distinguishing between clientelism and patronage, Erdmann and Engel (2007: 107) note that "[c]lientelism implies a dyadic and asymmetric relationship between patron and client, while patronage refers to the relationship between an individual and a bigger group." This approach to delimitation of patronage from clientelism is rather rare than common in the literature. Notwithstanding, I employ it due to its heuristic value for one particular purpose of the study – to differentiate between incumbent strategies targeted at securing political loyalty of elites and political support of masses – the purpose that was substantiated in the previous subsection. For the sake of clarity, these terms can be used in combination throughout the study – mass patronage and elite clientelism. I do in no way insist, however, that such delimitation between patronage and clientelism should be adopted in different research contexts.

Patronage and clientelism are two types of legal distribution of benefits that is contingent on political loyalty of its recipients. The contingency of distribution allows to differentiate patronage and clientelism with programmatic distributive politics in which the delivery of goods is determined by publicized explicitly formulated rules and it does not depend on electoral behavior or another manifestation of political loyalty. At the same time, the provision of goods in the case of patronage or clientelism is a legal practice. The legal form of distribution allows to distinguish patronage and clientelism from essentially illegal practices – electoral fraud and corruption. As it was argued earlier, the nature of goods is not a distinctive factor in distributive politics. All types of distributive politics can include personal and collective goods being distributed. The classification of types of distributive politics is displayed in Table 1.3.

Table 1.3. The types of distributive politics

Type of Distribution	Form of Distribution	Recipients	Type of Goods	Name	Examples
Non-Contingent	Legal	Elites	Personal	Program-matic Distribution	Maintenance of a Royal Household
			Collective		Right-Wing Taxation Policy
		Voters	Personal		Food Stamps, Education Grants
			Collective		Publically Funded Education or Medicine
Contingent on Political Support and Loyalty	Legal	Elites	Personal	Clientelism	"Kadyrov's Palace" [a]
			Collective		High Officials' Wages
		Voters	Personal	Patronage	Private Good Social Programs (Magaloni et al. 2007)
			Collective		Public Good Social Programs (Magaloni et al. 2007), High Public Employees' Wages
	Illegal	Elites	Personal	Corruption	Direct Bribery (Cash on the Spot)
			Collective		Misappropriation and Embezzlement of Public Funds
		Voters	Personal	Electoral Fraud	"Carousel"[b]
			Collective		"Denis Agashin"[b]

Note: a. See main text for details. b. See Table 2.1 in Chapter 2 for details.

For descriptive purposes, the table gives examples for the each type of goods distribution, which by no means encompass all the variety of practices. To clarify the argument of the previous subsection that the politically contingent distribution is targeted primarily or solely at voters but not elites in democracies (the scope of elite clientelism is highly limited in democracies), consider the case of Kadyrov's palace. The palace of Ramzan Kadyrov, which is officially called the Residence of the Head of the Chechen Republic, with a cost of about 10 billion RUB (an equivalent of $320 million) and an area of 260 thousand square meters was put into service in 2012 (Balashova 2012). Chechnya is one of the most heavily dependent regions on federal transfers. On average, it has annually received 70.0 billion RUB (in constant prices of 2012) in the period of 2004–2012 that amounted 89.0% of its total budget revenue. Chapter 5 shows that the lion's share of this non-tax income is determined by the region's high level of the vote for the federal presidential incumbents (94.1%, on average in elections of 2004–2012). The Chechen government has two basic options how to spend this money. It may invest in the post-war recovery and reconstruction of schools, hospitals, roads, the electricity grid, and other publically used infrastructure or raise wages to public employees relatively to the private-sector wages, that is, invest in voters (patronage). Otherwise, it may invest in goods consumed primarily by the regional elite (clientelism). The presidential palace of a cost of 14.3% of the average annual income from the federal transfers or 12.7% of the total average budget revenue is a good example of the clientelist spending. The fact that the central authorities allow regional officials to spend public money in such wasteful manner indicates nothing else but an intention of the central authorities to buy loyalty of regional officials by these means. The regional officials, in their turn, buy loyalty of their subordinates in a similar manner – they pay them high wages, buy expensive administrative use vehicles, build luxurious official residences, etc.

Presidential residencies definitely exist in democratic countries; it is also cannot be excluded that bureaucrats are paid higher wages relatively to the private-sector wages. However, the politically *contingent* delivery of benefits to secure elite loyalty has at least three limitations in democracies. First, no democratic party would win elections if it publically declared that its preferential policy is supplying top officials with luxurious palaces and favoring the bureaucracy in expense of all other tax payers, even irrespectively of political loyalty of the recipients. Second, even if the real reasons of the distribution are concealed from the public, there is no need to buy loyalty of opposition elites if electoral mechanisms allow effectively compete for power by appealing to voters in elections. Third, loyalty of political elites has much less importance in democracies since their leaders do not have to mitigate the threat of *coup d'état* that comes from discontented elites in autocracies when electoral channels of political competition are clamped or closed. Nevertheless, Table 1.3 suggests that the *non-contingent* distribution that is targeted at elites is possible in democracies. Such programmatic distribution may take the form of maintenance of a royal household (as an example of (almost) personal goods provision) or a right-wing taxation policy that is favorable to economic (and political, if they overlap) elites.

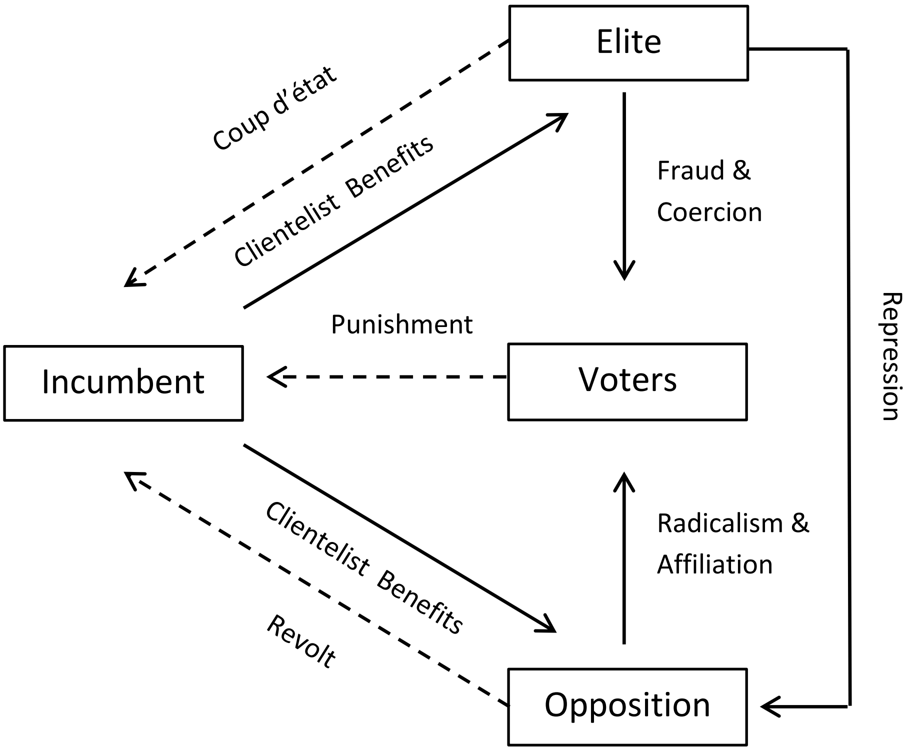
Finally, it is important to note the difference between patronage politics and welfare state politics, and between patronage voting and economic voting. In essence, patronage is the non-programmatic but politically motivated distribution of material goods that is contingent on voter behavior. In welfare states, aims and rules of distribution are constructed in the open process of public deliberation and actual distribution matches with the declared goals. All eligible recipients receive goods according to these rules regardless of their political support of the party in power. Patronage politics, to the contrary, routinely violates the officially declared rules and factually pursues the goal of distributing benefits to political supporters of the incumbent. The difference between patronage voting and economic voting is the following. In the case of the unbiased economic voting, voters consider themselves personally responsible for their welfare and consider government economic policy only as an environment that can be whether favorable or not. In the case of patronage voting, by contrast, voters consider the incumbent responsible for their own well-being and, therefore, become less susceptible to the fluctuations of the economy since their livelihood is “bestowed from above”.

The argument: Two Perspectives on Authoritarian Survival

Summarizing the argument developed in the prior sections, authoritarian dominance can be basically explained from two perspectives: elite-oriented and mass-oriented. Securing loyalty of political elites allows authoritarian incumbents to deter elite splits and decrease the probability of a *coup d’état*. Loyal elites, in their turn, may not only refrain from challenging the incumbent but also organize electoral fraud, repression of the opposition or media censorship. At the same time, incumbents may target the distribution of patronage at voters and use electoral support as a counterbalance against elites. It follows therefrom that the argument tested in this study is twofold.

On the one hand, authoritarian incumbents have to invest in elites. Technically, this can be done with the help of several tools – legal and illegal as well. Examples of the former include contingent public expenditures, such as federal transfers or pork barrel projects. The latter includes bribes in the form of direct cash payments or more long-term illegal activities that typically referred to as corruption, which may take two main forms – using public funds for private gains (i.e., embezzlement or misappropriation) and imposing extralegal fees (i.e., kickbacks) on business in the private sector of the economy. Loyal elites supply the incumbent with another illicit authoritarian instrument, namely, electoral fraud that may take the forms of vote buying, voter intimidation, and deliberate vote miscount. Loyal elites may also repress opposition forces to exclude them from public sphere and make them politically radical.

Figure 1.2. Elite-oriented authoritarian equilibrium

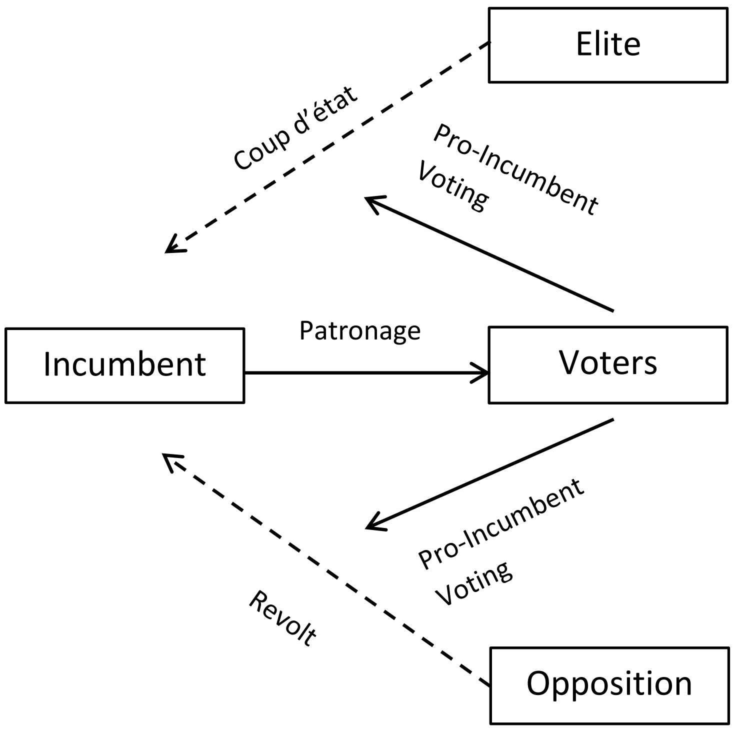


Note: solid lines represent incumbent-supporting strategies; dashed lines refer to incumbent-threatening strategies.

Figure 1.2 depicts this elite-oriented authoritarian equilibrium. Such equilibrium, however, has one shortcoming. Namely, voters receive no positive stimulus to support the incumbent. Consequently, there is no ground for sincere voting. In the long run, voters should tend to punish the incumbent at the polls or abstain if this option is unavailable.

On the other hand, the main source of the electoral incumbency advantage in authoritarian regimes is mass patronage. Authoritarian incumbents may invest intensively in social spending to provide welfare for voters, which is, however, conditional on their political loyalty. Figure 1.3 displays the logic of electoral authoritarian equilibrium. The incumbent buys voters' support via patronage. The electoral support of autocracy, in its turn, demotivates the opposition to question election results, decreasing, thereby, the probability of mass revolts and "color revolutions". The mass support also discourages the members of the ruling elite in their attempts to coalesce with opposition forces and in committing actions to violently overthrow the incumbent. Of course, clientelist (elite-oriented) and patronage (mass-oriented) strategies are not mutually exclusive. In a stable electoral autocracy, they should rather be employed by the incumbent in nearly equal proportions. Moreover, the exclusion of mass support from the model makes electoral authoritarianism theoretically fragile since the absence of sincere voting for the incumbent leaves no room for a meaningful electoral competition.

Figure 1.3. Mass-oriented authoritarian equilibrium



Note: solid lines represent incumbent-supporting strategies; dashed lines refer to incumbent-threatening strategies.

This argument results into two main competing hypotheses of the study.

H1: the politically contingent distribution of benefits to elites by the incumbent entails electoral fraud, persecution of journalists and other intrinsically authoritarian policies.

H2: the politically contingent distribution of benefits to voters determines sincere voting.

Whereas null hypotheses imply that benefits are distributed to elites and/or voters not contingently on their loyalty but on the basis of merit or need; and that the politically contingent distribution of benefits to either elites or voters does not induce politically relevant outcomes or factual outcomes run counter to outcomes stipulated by H1 and H2 (for example, if elite loyalty is translated into mobilization of authentic electoral support by delivering more benefits to voters rather than perpetration of electoral fraud).

To test these hypotheses, the study focuses on monetary transfers allocated from the federal center to Russia's regions. Chapter 5 presents the evidence that, although the size of transfers was partially determined by regional economic and social needs, the level of the vote for the federal presidential incumbent was also crucially important for predicting the amount of transfers in the period of 2000–2012, especially in the regions that were net recipients of transfers. And this relationship turns out to be stronger over time as authoritarianism becomes more developed. To disentangle how the federal transfers are consumed in the regions, Chapter 6 considers two major directions of spending. One is associated with regional elites (the size of the bureaucracy and monetary allocations in its favor), while the other accounts for the region's voters (the size of the spheres of healthcare and education and money allocated to these spheres). The results show that whereas the transfers were consumed by voters and elites in nearly equal proportions in the early 2000s, regional elites began to derive more and more benefits from transfers in their favor as authoritarianism proliferated up to 2012.

The second part of the argument – the outcomes of the contingent distribution – is tested primarily by using an original measure of electoral fraud developed in Chapter 4. The analysis in Chapter 6 unveils that the regional level of electoral fraud is in fact predicted by the amount of transfers received from the center. And the effect of transfers on fraud increases over time as regional elites divert more transfer funds in their favor, the overall amount of fraud grows, and the regime becomes more authoritarian. The central transfers are also positively associated with persecution of journalists and negatively – with the regional level of democracy.

However, the results of the analysis in Chapter 6 do not find confirmation to the impact of the politicized transfers on the sincere vote. The sincere incumbent's vote measured as the difference between the official vote and fraud turns out to be largely unexplained by the main as well as by control variables. Although the amount of fraud was the minimal and federal transfers were more evenly distributed between voters and elites in 2000, the transfers did not influence the sincere incumbent's vote even in this election year. Thus, the results of the study support H1, yet, contrary to theoretical expectations, reject H2.

This partially negative result, nevertheless, is also valuable and has two theoretical implications. First, it contributes to the debate on distributional consequences of different political regimes (Boix 2003; Acemoglu et al. 2015) by revealing the mechanism that leads to higher inequality in authoritarian regimes, namely, that authoritarian incumbents have to deliver benefits to political elites in order to secure their loyalty, which is subsequently converted into electoral fraud, repression, and other authoritarian policies carried out by the elites. Second, it implies that popular support for authoritarian incumbents can be poorly explained within the rational choice framework, at least by the theories of distributive politics, and that this theoretical question requires further examination. As an avenue for further research, I offer a possible explanation in Appendix F6 that suggests that Putin's regime derive popular support from extensive use of propaganda in state-controlled media, which is willingly absorbed by the public due to its attractiveness compared with true information. The official propaganda lowers psychological costs of perception of reality by presenting the situation in the country through the lens of rose-colored glasses – it understates economic problems, exaggerates positive achievements, redirects political responsibility from the incumbent to the abroad, and always draws good perspectives for the future, whereas an objective vision of reality gives much more reasons for pessimism. Because of this, a vast majority of citizens stick to the biased sources of information and tend to reject the evidence of incumbent's incompetence, even if they occasionally encounter it.

It must be noted that this dissertation presents rater a sketch of the full argument on authoritarian survival since not all elements of the elite-oriented and mass-oriented authoritarian equilibriums are examined in the study. I primarily focus the analysis of electoral fraud and its relationship with distributive politics inasmuch as fraud is unequivocally a hallmark of electoral authoritarianism and it implies a shorter chain of causality compared with repression, for example (see Figure 1.2). Repression, co-optation, affiliation, and marginalization of the opposition as well as their effects on voters and the incumbent are not explored due to limitations imposed by the format of the dissertation. Furthermore, Figure 1.2 displays a simplified picture. It does not include censorship, persecution and bribing of journalists, and propaganda. These authoritarian practices do not have the same logic and would complicate the picture. For the same reason, several items from the "menu of manipulation", even those that are overviewed in this chapter, are not shown in Figure 1.2 and 1.3. I do also not explore how delivering of clientelist benefits to the elite influences the probability of *coup d'état*, electoral defection, anti-incumbent legislative voting, and other forms of challenging the incumbent. As to the mass-oriented authoritarian equilibrium, I do not examine whether sincere public support for the incumbent reduces opposition and elite activities in the sphere of challenging the incumbent – coups, defections, mass protests, and revolutions. Thus, the argument developed in this section is tested throughout the study in its minimal version.

Russia in Comparative Perspective

The case of Russia was selected owing to several reasons. First, Russia is a typical example of electoral (Schedler 2006) or competitive (Levitsky and Way 2010) authoritarianism. Allegedly democratic institutions exist and opposition forces, even though in a limited extent, are allowed to form political parties and compete in elections. At the same time, biased mainstream media, repression of the opposition, coercion of voters and other types of electoral fraud so strongly distort the electoral playing field that the opposition can only dream about victory. Moreover, electoral authoritarianism in Russia is persistent. The regime has already passed the three-term longevity threshold in 2012 and even the four-term threshold in 2018 applied for defining dominant parties by Sartori (1976) and Greene (2007), respectively, and it cannot be seen as vulnerable to transition.

It must be noted, however, that Russia's political regime is not a party-based dictatorship; it can be defined as an authoritarian regime *with* a dominant party in a limited quantitative sense only. Such definition follows from the fact that United Russia stays in office since 1999 (or from 2003 if its predecessors are not considered) and systematically controls the legislature, even though it does not always receive a majority of the vote (Reuter and Remington 2009). In order to define a dominant party regime in qualitative terms, other substantive criteria must be met. In particular, Huntington and Moore (1970: 30) note:

> "[w]here the authority of the party is strong the top leader will be a product of the party and will be a party careerist, having worked his way up through the ranks of the party organization. This is the situation in both Mexico and the Soviet Union. [...] A second criterion of party strength vis-a-vis the leader is the extent to which the party monopolizes the process by which the top leader is chosen. [...] Finally, the authority of the party is enhanced to the extent that the formal office which the leader occupies is a party office."

The case of United Russia meets none of these requirements. Not Vladimir Putin has been promoted to his office as a party careerist but rather United Russia has emerged as the "party of power" or, more plainly speaking, as the "party of Putin". The role of United Russia in the process of leadership selection has remained marginal at all levels of government. On the eve of the presidential 2008 election, Dmitry Medvedev appeared from the unknown as Putin's hand-picked successor (*preemnik*), not as United Russia's activist, though his candidacy was formally "rubber-stamped" by United Russia. The party membership of the top officials not infrequently takes ludicrous forms. For instance, Medvedev was nominated to the presidential post at the VIII party congress in 2007. Five years later, after having served his presidential term, he received his party ballot and was elected to the post of United Russia's chairman in 2012 (Astahov 2012), not the other way around. His biography posted on the party website does not inform that he was nominated to the post of prime minister of the Russian government in 2012 (Medvedev 2018), and this is true, he was virtually "nominated" by Putin. Putin himself has managed to remain nonpartisan, even despite the fact that he was elected at the post of United Russia's chairman at the IX party congress in 2008. Especially for this case, the party program was amended: its item 7.1.2. states that "a citizen of the Russian Federation who is not a member of the Party can be elected the Chairman of the Party". The temporarily last (but probably not the final) point in this interplay between the leader and the party has been put by Putin when he, allegedly due to electoral concerns, decided to neglect his party's support and balloted as independent (*samovydvizhenets*) to the presidential post in 2018 (Azarnovsky and Kholmogorova 2017). Along with that, few (if any at all) federal ministers can be found whose biographies contain significant traces of party activism in United Russia. At the regional level, governors were "forced into joining the party" (Reuter 2010: 299) rather than strived to receive the party ballot to obtain access to party spoils, electoral advantage or other resources associated with the party.

Russia's political regime under Putin is quite the opposite of Huntington and Moore's definition – it is a personalist autocracy.[23] In their classical work, Bratton and Van de Walle (1997: Ch. 2) argue that presidentialism, as an institutional framework for personalism, is a key feature of neopatrimonial states, along with

[23] In a more concise yet substantively similar manner, Geddes (1999: 7) notes that "[i]n single-party regimes, access to political office and control over policy are dominated by one party, though other parties may legally exist and compete in elections. Personalist regimes differ from both military and single party in that access to office and the fruits of office depend much more on the discretion of an individual leader." Building their classification of authoritarian regimes upon Geddes (1999), Geddes, Wright and Frantz (2014) code Russia throughout the entire period of 1994–2010 as a personal dictatorship in the Autocratic Regimes Data Set (available at: http://sites.psu.edu/dictators/). Contrary to Geddes (1999), Geddes, Wright and Frantz (2014), and Huntington and Moore's (1970) definition, Reuter and Ghandi (2011) code Russia in 2004 as a dominant party regime.

clientelism and massive redistribution of public resources. Defining neopatrimonialism, Bratton and Van de Walle (1994: 458) note that "[t]he essence of neopatrimonialism is the award by public officials of personal favors, both within the state (notably public sector jobs) and in society (for instance, licenses, contracts, and projects). In return for material rewards, clients mobilize political support and refer all decisions upward as a mark of deference to patrons." This study finds support for Bratton and Van de Walle's elite-related argument. In particular, it shows how, in return for larger central transfers, regional elites, rather than mobilizing electoral support, perpetrate electoral fraud for the incumbent, persecute journalists and implement similar policies that generally lead to progressing of authoritarianism.

Below, I let myself to quote Bratton and Van de Walle (1994) broadly in those particular places that are especially relevant to Russia. They write regarding the degree of personal power of the leader and its relationship with the regime:

> "[p]ower is so concentrated that the disposition of the regime is synonymous with the personal fate of the supreme ruler. Real political change is unlikely as long as the ruler remains, since he has made all the rules. Likewise, opportunity for regime change occurs only with the death, deposition, or flight of the strongman, which becomes the primary objective of the opposition throughout the transition" p. 475.

Implicitly answering to this primary objective of the opposition, Vyacheslav Volodin, the deputy head of the Russian presidential administration, makes even a stronger claim: while "there is Putin – there is Russia, there is no Putin – there is no Russia" (Rosbalt 2014). Even if this phrase was driven by wishful thinking, it, nevertheless, indicates the direction in which the political establishment prefers to manifest its views publicly.

The politics of personalism tends to create a narrow circle of the ruling elite (the small size of the winning coalition (*W*) in Bueno de Mesquita and colleagues' (2003) terms), to such extent narrow that "political leaders may represent no more than a tiny coterie of clients" (Bratton and Van de Walle 1994: 465). This ruling elite, winning coalition or the group of insiders is personally committed to the leader, yet its loyalty is primarily based on personal benefits delivered via clientelism:

> "few rulers tolerate dissent; they typically expel potential opponents from government jobs, from approved institutions like ruling parties, or even from the country itself. Even if most individuals can expect eventually to be forgiven and

> brought back into the fold, such practices establish a zero-sum, nonaccommodative pattern of politics. Whereas insiders enjoy preferential access to state offices and associated spoils, outsiders are left to languish in the wilderness. The more complete their exclusion from economic opportunity and political expression, the more strongly outsiders are motivated to oppose the incumbent regime" p. 463.

Leaders of the personalist regimes bear higher risks of criminal prosecution if they were to lose power:

> "[t]he willingness of personal dictators to step down often depends on whether they fear prosecution for their egregious abuse of state powers and privileges. They tend to cling desperately to power. [...] They believe the opposition's promises to prosecute them and, recalling the ignominious exile of Marcos of the Philippines or the Shah of Iran, fear they can never be safe" p. 476.

These rulers' fears are not groundless under authoritarianism. Furthermore, the situation is exacerbated by personalism. Geddes, Wright and Frantz (2014: 321) show that most leaders of personalist authoritarian regimes (69%) end up with exile, imprisonment or death after ouster, whereas only 37% of ousted authoritarian dominant-party leaders face such a dramatic fate. A collective rule of party-based autocracies diffuses responsibility between numerous members of the Politburo and other party functionaries and creates a sense of collective irresponsibility for regime crimes. In personal dictatorships, everyone knows who is to blame. In this connection, I argue in Chapter 4 that authoritarian incumbents tend to resort to electoral fraud even in those cases when it may seem unnecessary. Specifically, high costs of electoral failure, which are generally intrinsic to authoritarian regimes, aggravated by the high clarity of criminal responsibility intrinsic to personal dictatorships, in combination with the authoritarian effect of distributive politics examined in Chapter 5 and 6, have determined high levels of electoral fraud in Putin's era.

The small size of the ruling coalition and the dependence of careers of its members on the choice of the leader determine strong cohesion of the ruling elite. As a result,

> "the insiders in a patrimonial ruling coalition are unlikely to promote political reform. Stultified by years of obeisance to the official party line, they have exhausted their own capacity for innovation. Recruited and sustained with material inducements, lacking an independent political base, and thoroughly compromised by corruption, they are dependent on the survival of the

> incumbent regime. Insiders typically have risen through the ranks of political service and, apart from top leaders who may have invested in private capital holdings, derive their livelihood from state or party offices. Because they face the prospect of losing all visible means of support in a political transition, they have little option but to cling to the regime and to sink or swim with it" p. 464.

In the aggregate, neopatrimonial regimes, as opposed to party-based regimes,[24] are characterized by the following distinctive traits: 1) an excessive concentration of power in hands of the president coupled with no or weak formal institutional constraints, 2) a small size of the ruling elite, 3) a high clarity of responsibility for regime crimes, and 4) as a result, resistance to political reforms becomes a vital value of the rulers.

In the case of Russia, typically for neopatrimonialism, the parliament and the "party of power" do not factually participate in decision making process. "The parliament is not a place for discussion" – states the prominent phrase attributed to the State Duma chairman Boris Gryzlov. Instead of the discussion over relevant policy issues and decision making, many authoritarian legislatures, including the State Duma, are rater used for co-optation of moderate opposition activists, promotion of economic interests by the businessmen (Sakaeva 2012), and making extra-governmental amendments to government bills initiated by the executive (Noble Forthcoming). In particular, Noble (Forthcoming) argues that the State Duma does not fully meet a classical definition of the "rubber stamp" inasmuch as it, even though rarely, postpones and amends bills introduced by the president or the government. Notwithstanding, the vast majority of amendments are passed not due to an elite-society dialogue but because of the conflict of interests over spending commitments between different factions in the executive, such as the Ministry of Finance and the Ministry of Economic Development.

To the contrary, all crucial policy decisions are done personally by the president, and the locus of decision making process is concentrated around the president and the presidential administration. Russia, however, is not entirely ruled by decrees and arbitrary decisions of the president as it is described by Bratton and Van de Walle (1994) in the cases of neopatrimonial personal dictatorships in Africa (Idi Amin in Uganda, Bokassa in Central African Republic, Macias Nguema in

[24] Bratton and Van de Walle (1994) contrast neopatrimonial states to corporatist states in Latin America. This is essentially similar to dominant-party, hegemonic-party, and single-party regimes, which I call here by the common term – party-based regimes.

Equatorial Guinea, Mobutu Sese Seko in Zaire, and Hastings Banda in Malawi). In particular, Treisman (2018: 18–20) differentiates two systems in Russian politics:

> "[t]he first – "normal politics" or "autopilot" – prevails when Putin does not personally get involved. Such cases, which constitute the vast majority of more mundane state activity, are poorly captured by common images of Russia as a centralized dictatorship. [...] The second system – "manual control" (*ruchnoe upravlenie*) occurs when Putin takes a clear stand. It involves a much more top-down dictation of actions – although the poor preparation of decisions and difficulties of implementation mean that the desired outcome is only sometimes achieved."

Russia is also not an absolute no-party personal dictatorship as Belarus, for example, in which 90.7% of elected legislative deputies were independents in 2000–2012, on average. In this regard, Russia is rather a modernized neopatrimonialism – a system in which formal institutions ostensibly perform their functions, yet informal institutions substantively prevail over then; actors within the framework of formal political institutions can make decisions on issues of minor importance or handle routinized affairs only, whereas most important decisions are made by the president, the power of which is *de facto* not limited by formal institutional constraints.

This study, thus, aims to contribute to the class of personalist regimes in which dominant parties play a minor role of electoral vehicles designed to curb opposition activity in the parliamentary arena but not to seriously participate in the contest for power and not for policy decision making. Parties in these systems are not used as political machines to deliver patronage to voters. Nor do they deliver considerable benefits to political elites (such as career promotion or electoral advantage); though forgoing party membership can be associated with additional costs. In the Russian case, as well, we do not observe armies of brokers (as an alternative to the dominant party patronage network or as an intermediary link between voters and the municipality) who distribute patronage before, during and after elections, as in the case of Argentina (Auyero 2000; Zarazaga 2014) or Peru (Muñoz 2014). It is, consequently, puzzling how do incumbents in such regimes retain power?

Magaloni (2006: 21–22) claims Russia under Vladimir Putin to be a "self-destructive authoritarian equilibrium" in which "the party organization is too weak to effectively operate a "punishment regime"" (p. 22) and authoritarian survival is, therefore, based on the long-term economic growth and the selective use of electoral fraud and repression applied against elite opponents and pro-democracy movements. Contrary to her argument, this study shows that distributive politics is not meaningless in Putin's Russia. Although the study does not find strong support for the hypothesis that the incumbent delivers patronage benefits to voters in order to obtain their electoral support, it provides empirical evidence that regional elites are prime beneficiaries of the central transfers, which are allocated based on political loyalty of their recipients, and that this loyalty translates into electoral fraud, persecution of journalists, and other intrinsically authoritarian policies. I do not test in this study another theoretically predicted outcome of elite loyalty – refraining from challenging the incumbent – the absence of which can manifest itself in three forms: electoral defection, participation in a *coup d'état*, and sponsoring, provoking or taking on leadership in mass anti-incumbent movements.

While the information on failed attempts of assassination of top officials is purposefully kept in secrecy in Russia, the governors' party membership allows to indirectly identify the influence of central transfers on electoral defection by governors.[25] In three out of four those rare cases where governors were members of formally opposition parties from 2008 (when United Russia's membership has virtually become compulsory) through 2017, the average 2008–2016 share of central transfers in budgets (STB) of their regions was lower relatively to the country's mean of 32.0%: Vladimir Oblast (governor's tenure:1997–2013; the STB = 26.6%), Irkutsk Oblast (2015–; 19.5%), and Smolensk Oblast (2012–; 25.8%). In the fourth case, Oryol Oblast (2014–2017), the STB was above the mean by only 0.37 standard deviations (38.8%). Furthermore, several governors of the ethnic regions (whose defection would be more painful to the regime), the budgets of which are heavily dependent on federal transfers, occupied or continue to occupy positions in the central United Russia party leadership: Adygea (2006–2017; 50.2%), Kabardino-Balkaria (2005–2013; 54.4%), Kalmykia (2010–; 57.3%), Republic of Altai (2006–; 73.2%); North Ossetia (2005–2015; 59.2%), Karachay-Cherkessia (2011–; 67.3%), Chechnya (2007–; 85.0%), and Ingushetia (2008–; 87.1%). Due to their stronger integration into United Russia, they will less likely to defect to an opposition party. Finally, there is no evidence on governors' support of mass opposition movements the most prominent of which was the post-electoral protest of 2011–2012. At the same time, several regime defectors have in fact leaded the protest process on Bolotnaya Square in Moscow. They were Mikhail Kasyanov, Minister of Finance

[25] There were no defections in its direct sense, that it, changing party identification from United Russia to KPRF or LDPR.

(1999–2000) and Prime Minister of Russia (2000–2004), Alexei Kudrin, Minister of Finance from 2000 to 2011, and Boris Nemtsov, governor of Nizhny Novgorod Oblast (1991–1997) and Deputy Prime Minister in 1997–1998. These persons lost their loyalty to the regime after having lost their access to state spoils and were (reasonably) called by regime's proponents the "party of the former ones" (*partiya byvshikh*).

To sum up, when loyalty of political elites is secured through clientelism, their repression is no longer necessary. Furthermore, loyal elites can respond to the incumbent with various forms of fraud and repression applied against opponents of the regime. Thus, this dissertation primarily shows that securing loyalty of political elites via delivering them clientelist benefits is crucial for regime survival in personalist electoral dictatorships.

Chapter 2. A Theoretical Framework for Studying Electoral Fraud in the Context of Russian Electoral Malpractices

Introduction

Electoral fraud is an intrinsic component of the bulk of non-democratic regimes. When successful, electoral fraud helps authoritarian incumbents to sustain political domination by creating the image of popular support, deterring elite splits (Magaloni 2006; Gehlbach and Simpser 2015), preventing opposition protests (Simpser 2013), and gaining international legitimacy (Hyde 2011). At the same time, the extent of electoral fraud in authoritarian regimes has not been studied properly in quantitative terms. Falsification of electoral results is still a sort of latent variable that is only implied "as default" in non-democratic regimes; the real value remains unknown. Defining competitive authoritarianism Levitsky and Way (2002: 53) write that "[a]lthough elections are regularly held and are generally free of massive fraud, incumbents routinely abuse state resources, deny the opposition adequate media coverage, harass opposition candidates and their supporters, and in some cases manipulate electoral results." Greene (2007: 34) and Magaloni (2006: 21–23, 258–259) argue that electoral fraud does not play a decisive role in electoral authoritarian regimes; it is rather used as an auxiliary or temporary tool when a dominant party's patronage fund exhausts. Instead scholars insist that large margins of authoritarian incumbents' victories are due to clientelist policy appeals (Wantchekon 2003), politically motivated distribution of municipal funds (Magaloni 2006), clientelism (Kitschelt and Wilkinson 2007), pork-barrel politics (Golden and Picci 2008) or political business cycles (Akhmedov and Zhuravskaya 2004; Treisman and Gimpelson 2001). However, the actual role of electoral fraud in sustaining non-democratic regimes cannot be examined without a quantitative estimation of the extent of ballot rigging.

The second element to be explained is that authoritarian elections are routinely characterized by high turnout rates. The classic rational choice theory implies that the probability of electoral participation depends on the decisiveness of the vote or, in other words, on uncertainty of the electoral outcome (Downs 1957). More recent research has also proved that turnout increases with shortening the electoral distance between candidates (Franklin 2004) and demonstrated that turnout decreases with negative perception of electoral fairness (Birch 2010; Carreras and

İrepoğlu 2013; Gerber et al. 2013; Simpser 2013: Ch. 7). Nevertheless, we can observe high turnout rates in cases where authoritarian incumbents win unfair elections with large margins. Minimax regret strategies (Ferejohn and Fiorina 1974) cannot explain this fact since the opposition in authoritarian regimes rarely poses a real threat to the incumbent. In democratic regimes we may easily imagine a motivation to voting related to support for basic democratic freedoms and liberties, yet in authoritarian regimes this motivation has no rationale. Therefore, a sense of civic duty (Riker and Ordeshook 1968; Blais 2000) should barely motivate moderate voters to go to the polls. The exception, however, may include ideologically committed voters supporting their candidates despite high participation costs and the inefficiency of the act of voting. Thus, high turnout rates and the large margins of victory enjoyed by authoritarian incumbents remain puzzling without thorough examination of the role of electoral fraud in non-democratic regimes.

Chapter 2, 3, and 4 aim to shed some light on this problem. This chapter, in particular, addresses the types of electoral fraud. By grouping the variety fraudulent techniques into specific types, it aims to provide an insight into the essence of each individual kind of electoral forgery to eventually take these nuances into account when electoral fraud will be examined quantitatively in Chapter 4. The first section considers definitions and presents a typology of electoral fraud. The subsequent sections discuss distinct types of electoral fraud, namely, pressure on voters, ballot stuffing, and violations of vote count. Using the data of the Russian parliamentary and presidential elections (2011–2012), I demonstrate graphically how different types of fraud change the relationship between the absolute vote share and the turnout rate. The conclusion summarizes the results.

A Typology of Electoral Fraud

There are several approaches to defining electoral fraud that can be classified by placing on a narrow-to-broad scale. Hausmann and Rigobon (2011: 7) define fraud as "the difference between the voters' intent and what the electoral system registered about their decision." This definition is empirically useful because of its narrowness and precision. However, classification of vote buying according to this definition is problematic since the fact of buying the vote virtually creates the voters' intent. An alternative approach on the other side of the spectrum broadly defines electoral fraud as a "menu of manipulations" (Schedler 2002) or "election rigging" (Calingaert 2006). This approach seems to be of lower reliability since it blurs the line between falsification of elections and the general bias of the electoral playing field. The definition of electoral fraud should also not be equal to any procedural violation of electoral law[26] (Lehoucq and Molina 2002) or to inconsistency with international standards of "electoral integrity" or "election quality" (Birch 2011a; Elklit and Reynolds 2005; Hall and Wang 2008; Hyde 2008; Norris 2013b). For instance, I do not consider such violations as the presence of a candidate's posters at the polling station or manipulations with the ballot to highlight a candidate of the electoral bid as cases of electoral falsification. This kind of violation unequivocally creates an inequality in opportunities between candidates, yet it rather coincides with the previous approach in equating electoral fraud with the biased field of electoral competition. In addition, it should be underlined that not every violation of the electoral code necessarily leads to change in the numbers of votes in return sheets. Thus, we should differentiate between electoral fraud in a broad sense that should rather be termed as electoral malpractice, electoral manipulation, electoral misconduct, and electoral dis-integrity, which usually encompasses all the processes of the electoral cycle (Norris 2012b), and electoral fraud in a narrow sense – the external influences that directly intervene between the initial choice of voters and the electoral commission's final vote tally.

Accordingly, I strive to detect the initial, genuine, authentic or sincere incumbent's vote based on the voters' preferences as if falsification of election results had not taken place. Conceptually sincere voting implies that voters cast their ballots without fear of punishment or extra benefits in the form of blatant vote buying. Although Cox (1997) contrasts sincere voting with strategic voting, in this context, I regard strategic voting and minimax regret strategy (Ferejohn and Fiorina 1974) as particular cases of sincere voting inasmuch as voters adjust their preferences to available electoral options based on probabilities of their implementation rather than sacrifice their preferences due to coercion or illegal material inducements. Electoral fraud, equivalently as falsification of election results, is defined as the difference between officially reported vote totals and the outcome of sincere voting.

[26] Birch (2012: 12) points out that domestic electoral norms may themselves be "corrupt". In fact, not only authoritarian regimes but also several well-developed democracies establish too restrictive legislative thresholds for entrance and competition of third parties. However, using international standards for assessment of quality of elections does not substantially alleviate limitations of this approach. See Chapter 3 for more discussion on observational data-driven methods of electoral fraud detection.

Table 2.1. The types of electoral fraud

Stage	Actors	Type of fraud	Control	Type of goods	Example
Voting	Voters	Vote buying	Yes	"Club" goods	"Denis Agashin"[a]
				Private goods	"Carousel" [a]
			No	"Club" goods	Concert
				Private goods	Gifts to voters
		Voter Intimidation	Yes	"Club" goods	EUPC[b]
				Private goods	Absentee ballot
			No	"Club" goods	Threat of withdrawal of organization's funds
				Private goods	Threat of dismissal
	Actors	**Type of fraud**	**Period**		
	Members of precinct electoral commission	Ballot stuffing	Before voting		
			During voting		
			During vote count		
	Actors	**Type of fraud**	**Impact on X and Y[c]**		
Vote Count	Members of precinct electoral commission	Vote miscount	Manipulating votes		
			Manipulating turnout and votes		
		Reporting fictitious results	Randomly		
			"In a dot"		
			"In a line"		
	Members of territorial electoral commission	Re-writing of protocols	Randomly		
			"In a dot"		
			"In a line"		

Note: a. See main text for details. b. EUPC refers to enterprises of uninterrupted production cycle. c. Here and hereinafter X denotes turnout, Y denotes vote share.

Although the area of electoral fraud studies has been growing rapidly over the last decade, it has been noted that "relatively few authors try to classify and count acts of ballot rigging" (Lehoucq 2003: 236). Since then the attempts to classify electoral fraud are still meager and rare (Calingaert 2006; Ziblatt 2009; Birch 2011a; Christensen 2012). This lacuna in the literature is more probably associated with the difficulty of encompassing the plenty of illegal practices in different areas: the electoral playing field (illicit use of state resources, state repression, and the media bias), voter registration, nomination of parties and candidates, electoral campaigning, and formal procedures of voting and vote count. Applying the stricter definition of electoral fraud and focusing only on voter manipulation and manipulation with voting results allows us to classify types of electoral fraud in a more feasible manner.

The approach applied in this study divides all types of electoral fraud into two main groups associated with pressure on voters and the actions of members of electoral commissions. This division is theoretically helpful as it could be interesting to examine which way of falsification is more widespread and in which type of authoritarian regimes. The classification is resented in Table 2.1. Obviously, these types of electoral fraud are rather "ideal types". There is often hard to draw a clear distinction between them in practice. Moreover, in reality these types of fraud may coexist simultaneously. For instance, vote buying in the form of "club goods" such as targeted programs may coincide with threat to withdraw funds (Magaloni 2006).

Fraud may occur during voting or vote count. At the voting stage, two main types of fraud can be distinguished: pressure on voters (including intimidation and vote buying) and ballot stuffing. At the vote count stage, voters cannot be involved in the process of falsification; for this reason, the only actors are members of electoral commissions.

The types of pressure on voters presented in the table (vote buying and voter intimidation) are sometimes viewed as subtypes of clientelism (Stokes et al. 2013; Nichter 2014; Kramon 2017) or used with clientelism interchangeably (Magaloni 2006). I suppose that clientelism differs from vote buying and voter intimidation not by its monetary or in-kind character of distributed goods but by the fact that bribed or intimidated voters, most likely, do neither vote in accordance with their true electoral preferences nor change them. From this standpoint, vote buying and intimidation of voters contradict the idea of sincere voting. However, the features of clientelism mentioned in the literature such as the character of goods and possibility to control the voter's choice seem heuristically relevant and are therefore used in the electoral fraud typology.

Pressure on Voters

The most common strategy of pressure on voters is vote buying, that is, the provision of tangible goods in exchange of the vote. The Russian State Duma electoral campaign of 2011 demonstrates a lot of such instances. The case under the label "Denis Agashin" is a typical example of vote buying, when organizers use club goods and can control their distribution depending on election results. In this notorious case Denis Agashin, the city-manager (indirectly elected mayor) of Izhevsk city, at a meeting with members of veterans' organizations unambiguously offered financial support to the organization in exchange for support for the United Russia. If the party in the district were to receive less than 50% of the vote, funding of the organization in the area would remain the same; if 51–54% were to vote for the party, then each organization would gain an additional ruble equivalent[27] of $6,000 annually; at 55–59% of the vote, the funding increase would amount to $23,000; the party results of 60% or more would provide $33,000 of additional funding.[28]

The most widespread example of controlled voting with using private goods to bribe voters is the so-called "carousel" or "revolving ballot". The scheme has long been used in Mexico and Milošević's Yugoslavia (Calingaert 2006). In order to guarantee voter commitment, the fraudster asks the first voter to enter the polling station to cast the ballot he is given by the fraudster and which is already marked for the required candidate. At the same time, he is to return the blank ballot he received in the station. The blank ballot is then marked and transferred to the next voter. Advancements in communication technologies have made this procedure obsolete. Practically, venal voters are now expected to photograph their ballots marked for the required candidate on a mobile phone in order to receive money for vote. In a sense, to falsifiers this scheme may seem old-fashioned and not as

[27] For better accessibility of information, numbers expressed in rubles are converted into U.S. dollars in this chapter. The average annual exchange rate in 2011 was 29.4 rubles per one U.S. dollar and 31.1 RUB/USD in 2012.

[28] A quote from the speech is instructive. "Today beginning from the top of the [Russian] Federation the allocation of money and all resources occurs exactly as follows: those who support now the acting power, and United Russia now is the "party of power", are supplied with money and funds. I have the following offer, which I will further bring to the republican officials. And I [discussed] all this in all four *raions*, which I have travelled around, with leaders of the primary organizations and with citizens. I told them one simple thing. If the party in your district gets less than 51 percent, nothing changes in financing because I have no grounds to talk with the City Duma deputies. They will tell me: what for? If [people] do not support the party that is doing, is trying to do, something today – why then financing? It means people don't need it. If the party in a district gets about 51–54 percent, I make a proposal to fund extra 500 thousand rubles per the district branch. If the party obtains in the district 55–59 percent – 700 thousand rubles. If the party obtains over 60 percent – 1 million rubles per the veterans district organization... In the future we will apply this approach to allocation of all financial flows. There, where we are supported, but not so as in Oktiabrsky district where 45% support us. Why should they receive the same amount of money as Leninsky district where 60% of the vote [goes to United Russia]?" The speech concludes with a whisper from the hall: "Oh, such a horror!" Eventually the Izhevsk city's court adjudged Agashin guilty in illegal campaigning and obliged him to pay a negligible fine of 2000 rubles (64 U.S. dollars at that-time exchange rate).
The video with Denis Agashin's speech is available at http://www.youtube.com/watch?v=f2B1r-iywco&feature=player_embedded#! or at http://www.youtube.com/watch?v=2G3_xxtxBKI (English subtitles).

efficient as it might be since one voter still provides only one vote. What is called "carousel" in Russian electoral malpractices is more advantageous compared with this single-vote buying. "Carousel", plainly speaking, corresponds to multiple voting by the same persons who are conveyed from one polling station to another and who receive a ruble equivalent of $15–30 for voting at each station.[29] By doing so, one voter may vote up to thirty times. The scheme does not stipulate such strict control as photographed ballots. However, since the "carousel" voters vote in groups organizers may threaten to verify their loyalty by comparing vote totals of the visited polling stations with other stations and subsequently punish members of the group altogether.

If organizers do not have the opportunity to control electoral behavior, vote buying may take the form of free mass entertainment such as concerts accompanied by political agitation or distribution of gifts to voters, which may occur on election day as well as during the electoral campaign. This type of non-controlled distribution of tangible goods falls beyond the explanatory mechanism proposed in several studies (Diaz-Cayeros, Magaloni and Weingast 2003; Kitschelt and Wilkinson 2007; Lehoucq (2007); Schaffer and Schedler 2007; Stokes 2005; Stokes et al. 2013) that emphasize the effects of monitoring, punishment, and contingency of benefits on the voter choice. However, more recent studies fill this theoretical lacuna by underlining an informational role of the non-contingent distribution. These studies assert that benefits distributed to individuals non-contingently on their electoral support allow brokers to legitimate their roles as reliable neighbors with a good reputation for accessing resources rather than vote buyers (Zarazaga 2014), to signal candidates' electoral viability (Muñoz 2014), and to convey information to voters that promises of the candidate who delivers benefits are credible with respect to future provision of resources (Kramon 2017).

It is worth mentioning that vote-buying mechanisms may not be straightforward. Nichter (2008) argues that what he calls "turnout buying" predominantly targets passive supporters whereby parties mobilize their own constituencies. Using the

[29] One report on the topic submitted to the *Karta Narushenii* (The Map of Violations) website of the election observation organization GOLOS stated that "Students from St. Petersburg State University in halls of residence are offered to make some money on the election (3,200 rubles). On election day, the bus will take the whole group of those who consented to polling stations. At each polling station voters have to vote for United Russia. Then the bus takes the group to the next station (overall there are 32 polling stations). If the violation is detected by authorities, students are offered legal assistance: 10,000 rubles for a legal adviser, 5,000 rubles compensation for being detained by the police and 10,000 rubles for caused injury. Those students who consented but did not come will pay a fine of 1,500 rubles." (http://www.kartanarusheniy.org Site visit – 21 November 2011.)

survey data on the 2002 presidential election in Kenya, Cramon (2009) has also shown that turnout rates rose by about 14 percentage points among individuals who were approached by a vote buyer, while the effect was stronger for the less educated persons. In this regard, the non-contingent distribution of private as well as public goods can be aimed at activating passive strata in the incumbent's electorate.

Another theoretical problem is that the non-contingent distribution may seem inefficient in terms of vote gains for each unit of expenditure if compared with schemes of controlled vote buying. It might be true if candidates used their own funds or if they had to engage in fundraising. Yet given that financing is allocated legally from the public budget, personal costs for organizers are relatively small. The general cost of the non-contingent distribution can be even smaller compared with controlled vote buying if political costs of blatant vote buying associated with moral rejection of this practice by voters (Weitz-Shapiro 2012: 570–571) are taken into account.

Indeed, since the Soviet era political strategists in Russia tend to organize elections so as to make them look like a festive day. Although gifts to voters are conventionally recognized as a form of vote rigging, inclusion of concerts in the category of vote buying may not seem appropriate. In fact, these concerts are often held under the guise of public events aimed to show concern by public officials for the cultural life of citizens. However, the crucial difference with public events is partisan bias. Saint-Petersburg's news agency *Fontanka.ru* reported on the eve of the 2012 presidential election that several district administrations in the city were preparing five concerts scheduled on election day, March 4, at a total cost of $44,600. Several officials denied that the concerts were associated with the election and claimed that there was only a coincidence so far as the concerts were dedicated to the celebration of spring and aimed at creating a festive mood among the citizens. Yet one official stated more plainly that such concerts are always linked to elections and that the announcers between the performances will remind people about the necessity to come to the polling station and to vote (Aksenov 2012).

In a similar vein, *Zaks.ru* reported that all tickets to Saint-Petersburg's Circus at Fontanka had been sold out until the end of the State Duma electoral campaign. Following this, residents began to receive invitations to visit the office of deputy Evgeny Marchenko to get free tickets to the circus. The performance itself was decorated by the party's emblems and preceded by a speech of a United Russia's deputy (Rabotnova 2011). It should be noted that mass entertainment organized for partisan purposes is conceptually close to patronage: it does not imply voter's coercion and leaves room for sincere voting. The only condition that allows to include it in the category of vote buying is the period of its implementation that does normally not extend beyond the term of the electoral campaign. If such kind of the distribution takes place in a long-term perspective, as described by Zarazaga (2014: 28) or Muñoz (2014: 87), it should be rather called patronage or clientelism.

Quite often pressure on voters occurs without provision of material inducements but solely by means of threats and coercion. The credibility of a threat to deprive voters of some private good or benefit may be achieved by controlling their vote choice. A typical example of this kind of electoral malpractices in Russia is related to manipulations with absentee voting certificates. Absentee certificates facilitate vote rigging in two ways. First, absentee certificates facilitate control over voters since using them makes possible to redirect voters residing in various districts to vote at a particular polling station where members of electoral commission are more willing to cooperate with fraudsters. This tactic may be employed especially where concurrent local and national elections are held. In those cases, local party bosses mobilize voters, first of all, for their own victory in the district and only vicariously – for their party. Second, if members of electoral commissions are also involved in the falsification scheme and do not invalidate absentee certificates after issuing ballots to voters, voters then may vote several times by using absentee certificates repeatedly. Early voting represents another example when secrecy of the ballot may be violated since voters deposit their voted ballots for storage in an envelope signed by two members of the commission. For this reason, voting may also be controlled.[30] However, the cases of early voting are relatively rare in Russia (2.5 ballots per polling station on average in the 2012 presidential election) and its distribution coincides with remote areas.

With respect to controlled intimidation of voters by threatening to annul any previously available club goods, an example may be found if the polling station is located at the territory of so-called enterprises with uninterrupted production cycle (EUPC). Voting in such polling stations can be easily controlled, and the reduction

[30] A typical report from the *Karta Narusheniy* website on this type of fraud stated the following: "November 14, 2011. The director of the kindergarten No. 33 located at: St. Petersburg, the second Murinsky ave., 10, block 2, Mescheryakova V.A. has invited employees to visit her individually and under threat of dismissal required employees to write a statement on early vote in the upcoming election of the State Duma, and each staff member had to vote for the political party United Russia". (http://www.kartanarusheniy.org Site visit – 21 November 2011.)

of state funding or subsidies for the enterprise may be a serious threat. There are also fewer formal restrictions on fraud because the access for electoral observers is considerably restricted. Threats to deprive voters of private goods (e.g., employment) sometimes are not accompanied by real actions of control in practice. The absence of control makes threats less credible. However, intimidation still may have a psychological effect.[31]

This is implicitly confirmed by Frye, Reuter and Szakonyi (2014) who argue that voter mobilization in the workplace is an efficient tool for autocrats to win elections. Using survey data collected by the Levada-Center after the Russian parliamentary election of 2011, they found that, on average, 25% of employees reported that their employers attempted to influence their decision to vote, whereas this proportion was the largest between regional and local government (32%) and federal government employees (37%).[32] However, even if a considerable proportion of employees has been exposed to pressure by their employers, this pressure in far from all cases resulted into the act of voting. The effect of mobilization on turnout reported by the authors in Appendix Table 5 is significant only at $p < 0.1$ (z-value = 1.69), whereas the effect of age is significant at $p < 0.01$ (z-value = 4.0). Hence, the probability of turnout for those employees who experienced pressure is by about 5% higher compared with the rest of the sample.[33]

This approach also overemphasizes the role of employees as independent actors. Frye, Reuter and Szakonyi note that the ruling party organizations are weak at the grassroots level in many electoral authoritarian regimes, including Russia, and

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[31] One example found on the *Karta Narusheniy* is related to a threat of funding withdrawal from a public hospital: "Chief Doctors arrange meetings where they tell that the Regional Health Department has given the instructions on required turnout rate and vote result. They ask not to let them [doctors] down and vote as described above. If their medical facility fails to meet these expectations staff reductions and other organizational sanctions will follow, hinting at the possibility of dismissal".
And a similar report was submitted regarding the threat of personal sanctions. "In this election doctors are given questionnaires to interview patients for whom they will vote, doctors are strongly recommended to write patients' phone numbers. People are afraid to file complaints because of fear of dismissal". (http://www.kartanarusheniy.org Site visit – 21 November 2011.)

[32] The authors (on p. 204 and in Appendix 2) refer to Levada-Center's Courier survey carried out from December 16 to December 20. A publically available Levada-Center's Courier 2011-17 conducted between 14.12.2011 and 21.12.2011, however, demonstrates another result. Out of 803 employees in the sample, only 66 (7.7%) reported that they noticed a pressure during the electoral campaign in order to induce them to participate in the election or to support a candidate exerted by employees in the workplace; 6.7% reported a pressure by the local authorities; 4.2% – a pressure by colleagues at work; 72.9% did not take any notice of pressure; and 10.2% did not answer. In the full sample of 1600 respondents, including entrepreneurs, managers, students, and pensioners, 103 (6.4%) reported a pressure by employees (see questions q48_1 – q48_5, available at: http://sophist.hse.ru/db/oprview.shtml?ID_S=3304&T=m).

[33] In a comparable model of 2012 in Table 3.4, the marginal effect of age on turnout (if age shifts from 20 to 70 years) is estimated to be 21.9% (z-value = 3.9), whereas the effect of gender, which is twice less significant (z-value = 2.1), yields 5.5% of higher probability of turnout for women. See Chapter 3 for details.

authoritarian leaders have to rely on employees to compensate this weakness. In fact, United Russia's local structures are not so strong to engage in face-to-face canvassing, voter intimidation or vote buying. At the same time, many firm directors, school principals, hospital chief doctors and other heads have United Russia membership. As follows from Table 3 in the article, director's support of United Russia is one of the strongest predictors (along with firm size) of workplace mobilization (i.e., managing political events[34] by a director).

The types of pressure on voters affect the distortion of turnout and vote shares for different candidates differently. We may assume two main differences. The first one is determined by whether voting is controlled or not. If organizers of fraud have an opportunity to control the voters' choices, one can expect the increase of the vote share for the candidate to be proportional to the increase in turnout. If voters are bribed by gifts or intimidated by threats of dismissal but control is not tight or absent, several voters may dodge the pressure and maintain their initial vote decisions. This leads to a weaker relationship between vote share and turnout.

The second difference is determined by the fact that absentee certificates and certificates of temporary registration are often used in "carousel" scheme of vote buying. Those voting with absentee certificates or temporary registration certificates are enrolled in the additional list of voters. If each additional voter casts a ballot in favor of the same candidate (ballot stuffing), the function of the *absolute vote share* calculated as the ratio of the candidate's votes (V_i^I) to the number of eligible (registered) voters (E_i) depending on turnout (T_i) looks as follows: $V_i^I/E_i = \alpha + 1T_i$, where α is the intercept.[35] Meanwhile drawing the additional list of voters makes the number of eligible voters not constant but increasing with each additional voter. Therefore T_i and V_i^I/E_i, calculated from extended E_i, are getting smaller compared with the initial E_i. Since V_i^I/E_i is normally less than T_i, V_i^I/E_i will change more than T_i. Consequently, the β-coefficient in the equation will exceed 1, especially at lower values of V_i^I/E_i relative to T_i.

[34] These include the following political activities: endorsing a specific party, inviting workers to join a political party, distributing campaign materials, providing meeting space to candidates, or holding campaign events. It should be noted that this measure does not necessarily captures "electoral subversion" since all these activities can be done on the basis of persuasion but not intimidation, coercion or bribing.

[35] The absolute vote share (V_i^I/E_i) should not be confused with the relative (ordinary) vote share (V_i^I/V_i). The latter is calculated as the ratio of the candidate's votes (V_i^I) to the number of valid votes (V_i) and ordinarily reported as a candidate's vote share. However, it is less appropriate for analysis of electoral fraud. See the main text for details.

To illustrate how the increase in the number of eligible voters leads to a relative decrease in turnout and vote share, Table 2.2 offers an example of the Russian 2012 presidential election in the city of Moscow. The number of eligible voters had changed by 127,896 between the parliamentary and presidential elections of 2011 and 2012. Population growth or other natural factors hardly account for this impressive change, which had occurred in a three-month period. It more likely resulted from the inclusion of non-Moscow residents – who voted using absentee certificates – in the voter lists on election day. Keeping in mind that the data of 2011 might have also been illegally altered, consider this number of votes to have been added to eligible, valid, and Putin's votes.

Table 2.2. Comparison of vote buying with absentee ballots and without

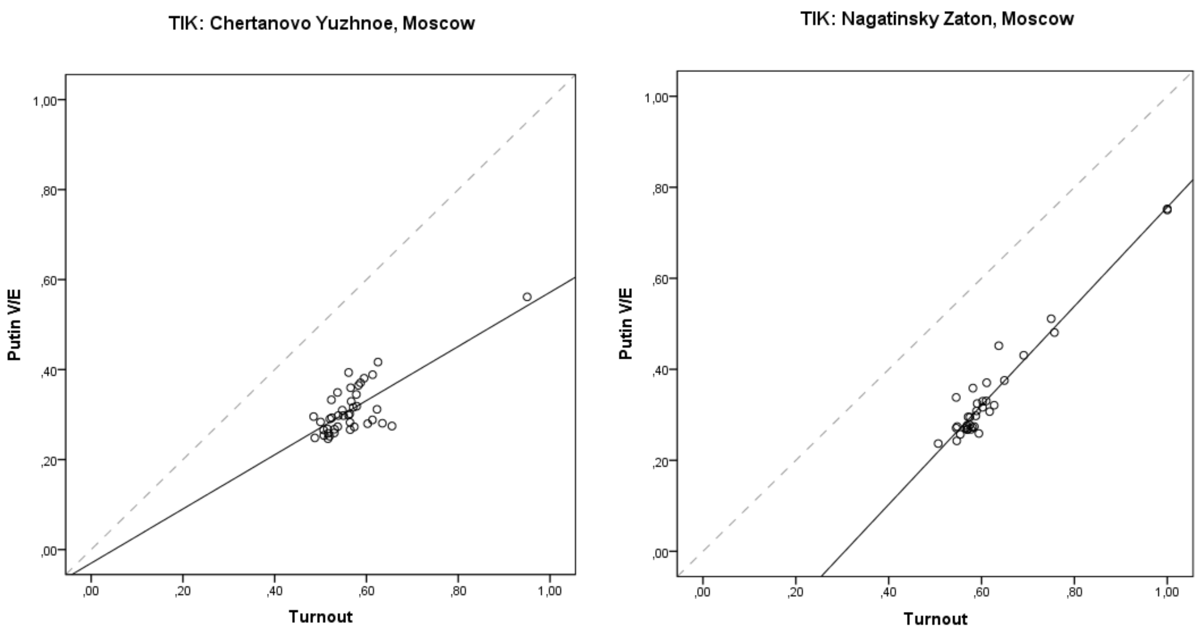
	Initial	Vote buying	"Carousel"
Eligible voters (E_i)	7182	7182	7310 (+128)
Valid votes (V_i)	4032	4160 (+128)	4160 (+128)
Putin's votes (V_i^I)	1866	1994 (+128)	1994 (+128)
Turnout (T_i)	.5614	.5792 (+.0178)	.5691 (+.0077)
Absolute vote share (V_i^I/E_i)	.2599	.2777 (+.0178)	.2728 (+.0129)
Relative vote share (V_i^I/V_i)	.4629	.4794 (+.0165)	.4794 (+.0165)
β = V_i^I/E_i change / T_i change		1	1.6753

Note: Numbers are in thousands of people. Changes in relation to the initial numbers are in parentheses. Eligible, valid, and Putin's votes for the "Carousel" model are officially reported numbers in Moscow, in the presidential election on 4 March 2012. Eligible number of voters for the "Initial" and "Vote buying" models is officially reported number of eligible voters in the parliamentary election on 4 December 2011.

Table 2.2 demonstrates that although vote shares calculated from the valid votes increase in both models of fraud in a similar way from 46 to 48 percent, the vote shares calculated as a proportion of eligible voters and turnout are smaller in the "Carousel" model than in the model of "Vote buying". Consequently the β-coefficient of the "Carousel" model is 1.68 compared with 1 in the "Vote buying" model. In other words, one percent of turnout growth produces a 1.68 percent increase in V_i^I/E_i. However, in this case all calculations are made for illustrative purposes but not for detecting the exact amount of fraud. Unfortunately, without precise knowledge of the initial number of eligible voters it is problematic to correctly define the scale of fraud of this kind or to differentiate it from other types.

During the presidential election of 2012 most of the carousel-type falsifications were noticed in Moscow. Figure 2.1 demonstrates the relationship between turnout and vote share for two suspicious territorial electoral commissions (TIKs). In both plots there is a noticeable group of observations standing out from the center of distribution and directed upwards to the right. The left plot also shows that OLS estimates in some cases may neglect this group.

Figure 2.1. Turnout and the absolute vote share for Putin in the territorial electoral commission "Chertanovo Yuzhnoye", Moscow. Presidential election 2012

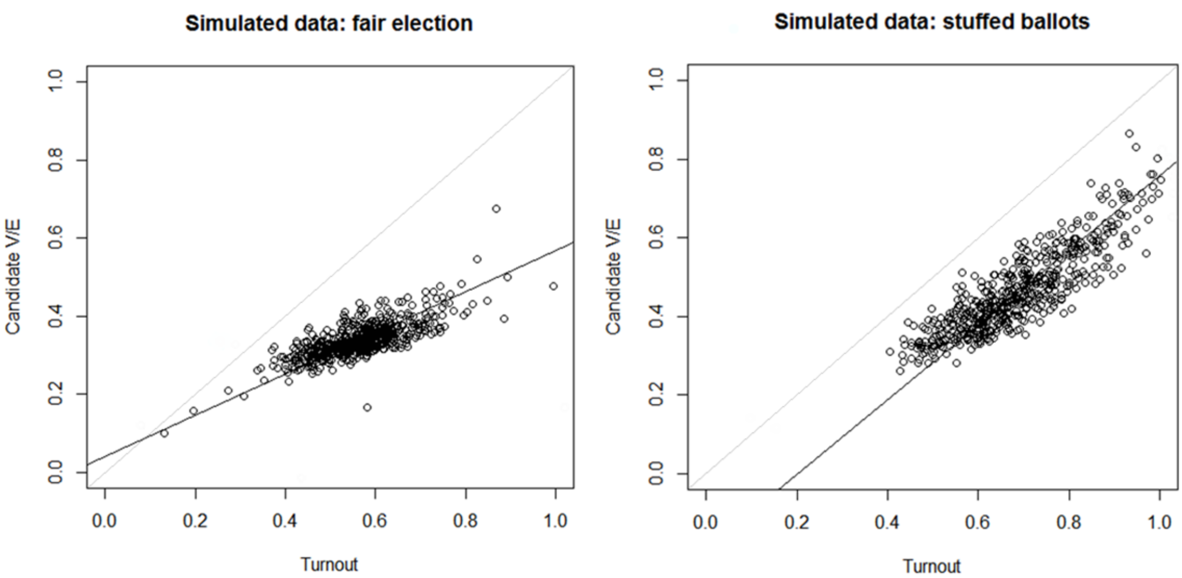


Nevertheless, pressure on voters remains an inefficient strategy compared with fraud committed by members of electoral commissions. For example, consider a district with the population-averaged number of eligible voters that is about 2000 people. Let us assume that the true turnout is 50% or 1000 votes, and 50% or 500 voters voted for the winner candidate. If 500 bribed voters come to this polling station, the number of true and bribed voters is equal. Such large-scale falsification is very costly, too conspicuous and easy to detect for observers. Notwithstanding, it would come up with increase of turnout only by 25% and raise of vote share for the candidate merely by 16.7% (1000 out of 1500 votes). Thus, pressure on voters involves high costs and brings few benefits to falsifiers. Therefore, given the absence of observers, fraud with engagement of members of electoral commissions is theoretically more feasible.

Ballot Stuffing

The first type of electoral fraud in this category is ballot stuffing. Although, voters often cast additional illegal ballots, Table 2.1 indicates that members of electoral commissions may also be responsible for ballot stuffing. Ballot stuffing, in fact, is technically impossible without their involvement and collaboration. First, according to the law, ballots from each polling station must have two signatures of the commission members and the stamp of the commission. This is why it is possible to acquire access to ballots only with consent of the head of electoral commission. Second, ballots cast with the stamp from another polling station or without signatures and stamps are void. This is to be detected during the vote count. Third, ballot stuffing tends to increase turnout thereby making validation of compliance of control values in protocols impossible (the number of issued ballots should fit the number of ballots in fixed and mobile ballot boxes). If electoral observers cannot check that the ballot box is empty before it has been sealed, stuffing the ballot box may happen before voting starts. During voting, electoral fraud is usually performed by other people who collaborate with electoral commissions. Ballot stuffing may also happen during vote count if members of the electoral commission unnoticeably place fictitious ballots in the dump of ballots ejected from the urn before sorting through them.

Figure 2.2. Simulation of a fair election and ballot stuffing



In any case, ballot stuffing proportionally increases both turnout and the candidate's absolute vote share according to the aforementioned formula: $V_i^I/E_i = \alpha + 1T_i$. This can be seen in Figure 2.2, which displays ballot stuffing with simulated data. On the left-hand graph, the estimated OLS equation is $V_i^I/E_i = 0.041 + 0.527 \times T_i$. On average, 200 ballots were randomly stuffed in favor of a candidate who initially received 577 votes on average. It raised the candidate's vote share from 60% to 69%; turnout rose from 57% to 72%. Ballot staffing substantively changes coefficients of the linear function: on the right-hand graph $V_i^I/E_i = -0.192 + 0.95 \times T_i$. The beta-coefficient in this case is pretty close to 1 and the fitted line is almost parallel to the limit line – $V_i^I/E_i = 0 + 1T_i$.

Violations of Vote Count

The next type of electoral fraud committed by the members of electoral commissions is violation of vote count procedure. If observers are present, the commission members cannot resort to blatant and excessively obvious means of fraud such as drawing absolutely fictitious numbers in the return sheets. However, they are left with two basic strategies. First, if the overall number of ballots has been calculated before the vote count starts, as it is required by the law, members of the commission might count opposition's votes as incumbent's votes without adding eligible non-voters to incumbent's score. As an illustration for this scenario I use the data of copies of the polling station protocols collected by observers during the parliamentary election in Russia of 2011 (RuElect 2011). Figure 2.3 shows a sharp difference between the distributions based on copies of the polling station protocols collected by observers and numbers reported by the Central Electoral Commission (CIK). Observations on the right plot are sparsely dispersed on the vertical axis leading to the inflated standard deviation of United Russia's vote share while the turnout is kept at a constant level.

It should be underlined that the distributions are shown only for illustrative purposes. Since the official data were altered after the polling station protocols had been filled with election results, the falsifiers' efforts rather were exerted in electoral commissions of the higher level. Nevertheless, the same-type falsification perpetrated during vote count would produce the similar distributions. The key idea illustrated in this section is that different circumstances and preconditions of fraud result in various divergent outcomes that can be identified by analyzing distributions of turnout and absolute vote share.

Figure 2.3. Falsification of protocols randomly by vote share: electoral observers' protocols and the official data. The parliamentary election of 2011

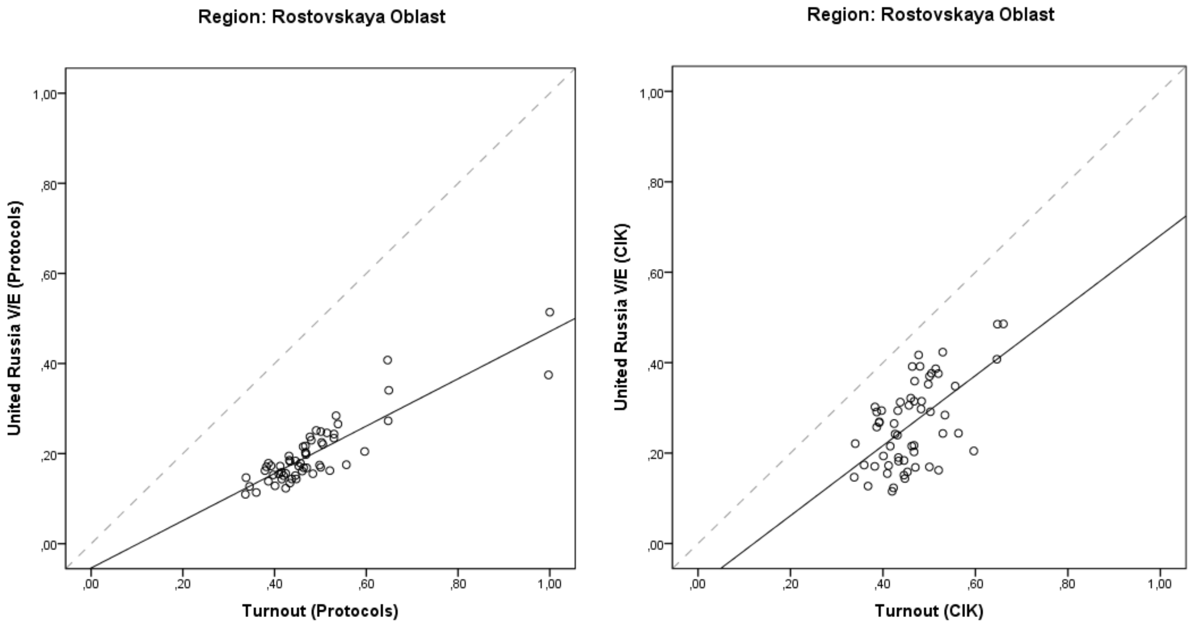
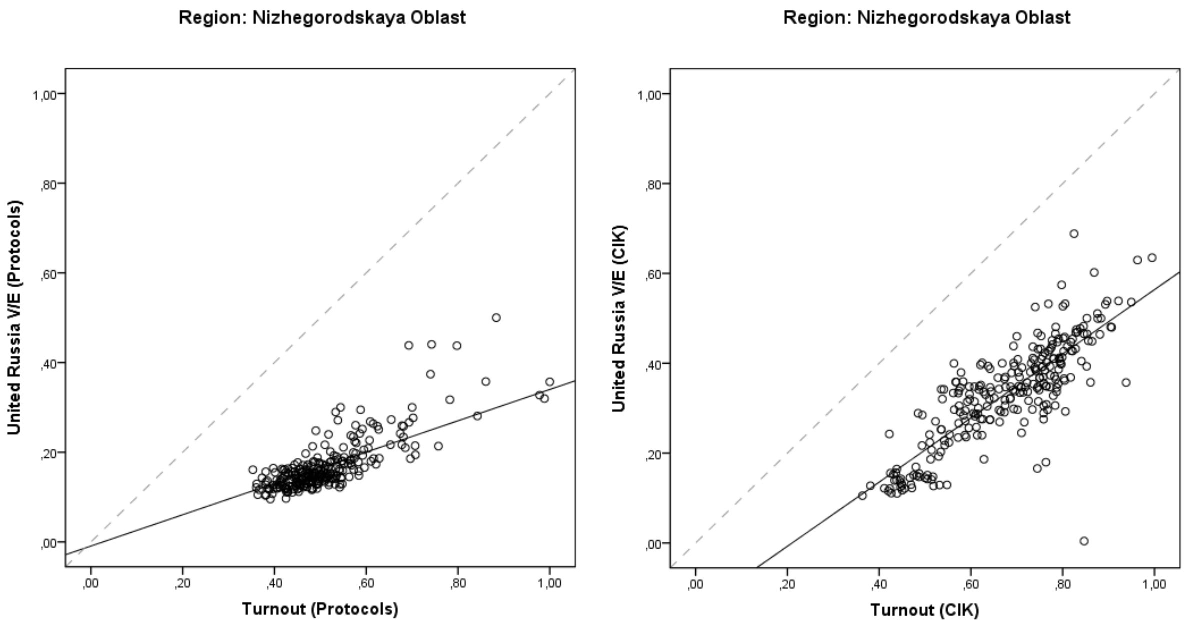
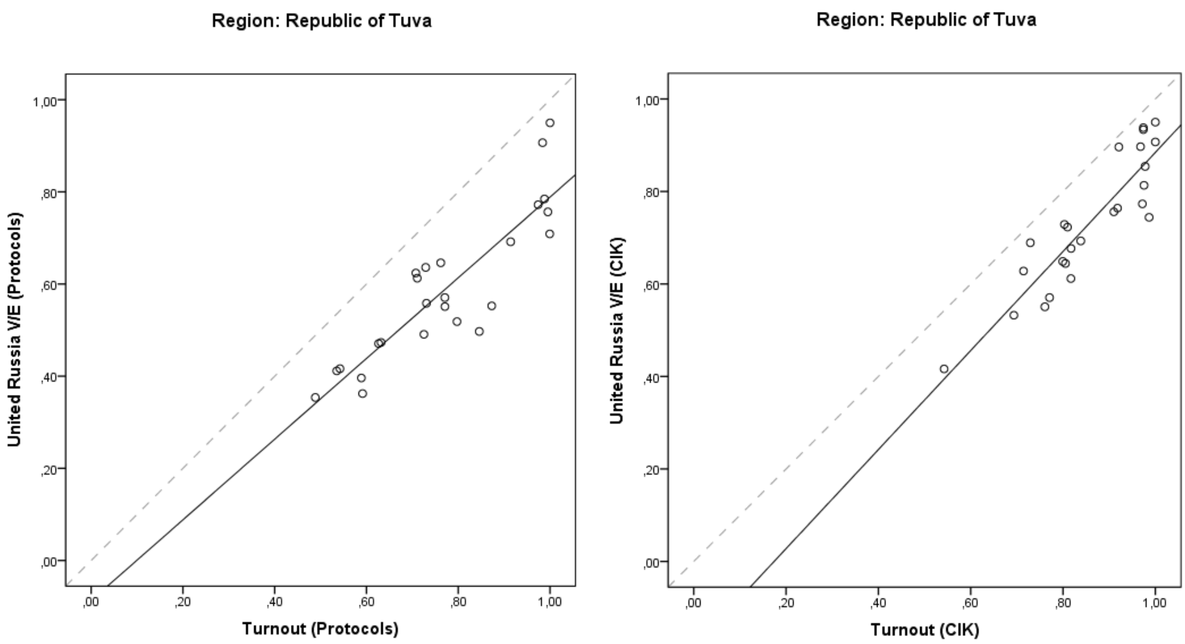


Figure 2.4. Falsification of protocols randomly by vote share and turnout: electoral observers' protocols and the official data. The parliamentary election of 2011



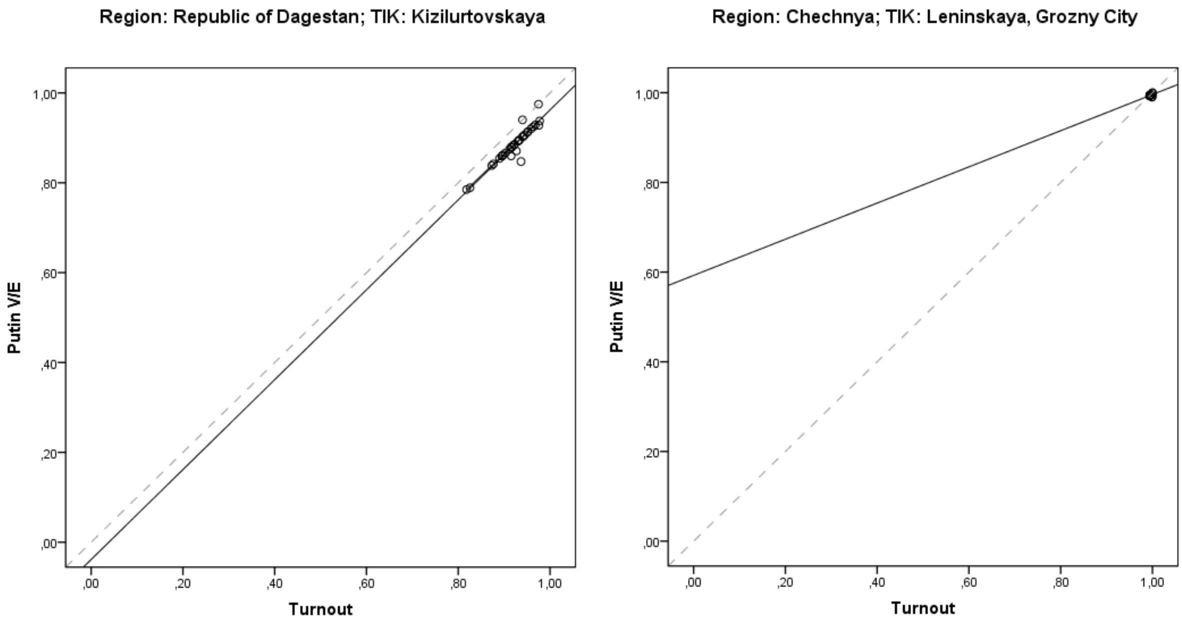
Second, if the overall number of ballots in ballot boxes is not counted separately but calculated by summing up valid and invalid ballots *after* counting them for all candidates, members of the electoral commission have more space for manipulation with not only vote share but turnout as well. Figure 2.4 suggests an example of simultaneous tampering with turnout and vote share. The official data is characterized by the greatly enlarged range of both variables compared with the data of electoral observers. Only a small group of cases located in the area near T_i = 0.45 and V_i^I/E_i = 0.15 remained unchanged after the election results had been officially reported.

Figure 2.5. Vote miscount and falsification of protocols. The Parliamentary election of 2011



Quite often, especially in rural areas electoral observation is absent, or observers are insufficiently trained or biased in favor of a given party, which means that members of the corresponding electoral commissions are not constrained in implementing fraud. If members of the commission do not receive the exact numbers of required vote shares and turnout but have the instruction "the more the better", the data are more likely to be falsified randomly. This scenario is demonstrated in Figure 2.5. The figure shows that observers were unable to prevent fraud. Both cases have significantly inflated standard deviations on the X and Y axes and considerably deviating α and β to indicate them as a fair election (see the next section for more details). Furthermore, the right-hand graph shows that observations generally shifted toward the extreme values, i.e., upper-level electoral commissions have also contributed to falsification of the electoral results.

Figure 2.6. Reporting fictitious results or rewriting protocols "in a line" and "in a dot". The presidential election of 2012



If members of a precinct electoral commission have exact instructions about the "necessary" outcome for their polling station, they might falsify vote share for the candidate closer to the required value without changing turnout. Then the distribution V_i^I/E_i ~ T_i approximates a line. Turnout may also be adapted to a required value. The distribution then becomes point-shaped. At the same time, if protocols are rewritten by members of precinct electoral commissions independently from each other and without external requirements of the exact expected election results such type of fraud should differ from a similar falsification perpetrated by the members of TIK since the latter acquires the information on election results simultaneously from all (or many) polling stations. Therefore, electoral data fabricated at the level of TIKs theoretically should more likely to fall into "a line" or "a dot". Examples of such impudent fraud are shown in Figure 2.6.

Conclusion

This chapter has classified and described the main types of electoral fraud; it has also graphically shown how different types of electoral fraud affect the distribution of turnout and the incumbent's vote share. It began by conceptualizing electoral fraud as the difference between sincere voting and the result of the official vote tally, and then applied this definition to draw a classification of electoral fraud. The typology, in particular, clarified that vote buying and voter coercion are sometimes mistakenly understood as clientelism in the literature. The crucial theoretical difference is, however, that bribed or intimidated voters sacrifice their true preferences while patronage normally leads to sincere support of authoritarian leaders. The discussion on various types of electoral fraud also reveals that, although monitoring of vote choice generally increases the efficiency of vote buying, unaccountable public officials still frequently resort to unconditional distribution of funds for partisan purposes under the guise of public events. Since the financing of such events is allocated legally from the public budget this strategy might be employed almost gratuitously by local authorities affiliated with the incumbent for mobilizing their passive supporters. However, the least-cost strategy for fraudsters given the absence, reluctance or poor training of electoral observers is a deliberate vote miscount or forging fictitious numbers in polling stations' protocols.

Chapter 3. Methods of Electoral Fraud Detection

Introduction

Since electoral fraud is an intrinsic prominent feature of authoritarian regimes, various studies aim to analyze it. They do it, however, viewing electoral manipulations from different angles. As it has been shown in the prior chapter, electoral fraud can be defined broadly (as any practice that biases the electoral playing field), juristically (as a violation of the electoral code) or narrowly (as the difference between voters' decision and electoral commission's vote tally). Accordingly, one group of studies examines electoral malpractices (Birch 2011a), electoral integrity (Norris 2013a; 2013b), and electoral fairness (McAllister and White 2011); another group analyzes allegations of fraud submitted for legal proceedings (Lehoucq and Minnite 2010; Molina 2002; Ziblatt 2009); several heterogeneous studies strive to define the exact proportion of fraudulent votes or the true vote share for the incumbent (Enikolopov et al. 2013; Frye et al. 2017; Kalinin (Forthcoming); Kobak, Shpilkin and Pshenichnikov 2012). The purpose of this chapter is to overview the existing methods of electoral fraud detection and to find out one that better matches the (narrow) definition of electoral fraud adopted in this study and that can be feasibly used in the analysis.

The entire pool of methods intended for detecting electoral fraud can be conventionally distinguished into two major groups. Observational data-driven methods rely on various assessments of fraud such as perceptions of electoral fairness expressed by respondents of public opinion surveys or experts of international organizations, reports of electoral observers, petitions of individual voters, or they are based on assessments of the actual election results as an opposite measure of electoral fraud. The second group – electoral data-driven methods – is more homogeneous since it employs solely the data reported by electoral commissions to quantitatively test electoral anomalies. Although this distinction in methods partially overlaps with qualitative-quantitative dichotomy, it is not equal to it. Electoral data-driven research indeed applies only quantitative techniques, yet perceptual data-driven studies may be either of qualitative or quantitative design.

This chapter is organized as follows. The first section considers observational data-driven methods, including expert indices and mass perceptions, allegations of fraud, public surveys, and electoral observation. It shows that observational data should be treated cautiously as far as these data are of subjective character. The second section discusses electoral data-driven methods (sample-based, digit-based, and distribution-based methods). Along with revealing advantages and disadvantages of these methods, it aims to define conditions under which, specifically distribution-based methods, would perform correctly, and how these conditions could be met. The findings are summarized in the conclusion.

Observational Data-Driven Methods

Expert Indices and Mass Perceptions of Electoral Fairness

One way for detecting electoral fraud is to ask persons who are familiar with the situation in their country about their perceptions of electoral malpractices. This may be done in the form of indices based on expert interviews such as the Freedom House's index of political rights, the Index of Electoral Malpractice based on ESCE election observation, and Susan Hyde and Nikolay Marinov's coding in the National Elections across Democracy and Autocracy. The indices may also be based on perceptions drawn from public opinion surveys like the World Values Survey, the Comparative Study of Electoral Systems, and the International Foundation for Electoral Systems, which include batteries of questions about quality of elections (see Tables 1 and 3 in Norris (2013a) for a broader list of cross-national surveys and expert indices).

It may be asserted that due to reliance on different sources of data and using different methodologies all these measures assess substantively different phenomena. Norris (2013a) counter-argues that expert and mass perceptions are substantively similar, and this similarity is indeed present between several indicators (see Figures 2 and 3 in the article). Notwithstanding, various measures of mass perceptions of electoral integrity *on average* have a small proportion of common variance with several expert assessments ($R^2 = 0.187$), while expert indices are more consistent with each other ($R^2 = 0.495$) and indices of mass perceptions are relatively congruent ($R^2 = 0.405$).[36]

[36] Numbers represent mean values calculated by author from Tables 6, 4, and 5, respectively, in Norris (2013a). Correlations presented in the tables have been firstly squared to obtain R^2 and then averaged. A simple averaging of correlations is less appropriate because of the squaring-related bias. For instance, corr. = 0.8 is

This difference between expert and public opinion data is implicitly confirmed by relatively high rates of confidence in the electoral process observed in authoritarian regimes. The data presented by Birch (2011b) demonstrate that 59.6% of respondents expressed a broad confidence in the electoral process in Belarus, which is even slightly higher than the level of Lithuania (55.85), although Belarus was scored 5 (the most misconduct) and Lithuania was scored 2 (almost the least misconduct) on the scale of Electoral Misconduct Index. And to the contrary, Carreras and İrepoğlu (2013) show that despite the fact that elections in Latin America have become significantly cleaner in the last thirty years, countries of the region still have paradoxically high rates of broad distrust in the electoral process, which vary from 7% and 13% in Uruguay and Chile to 50% and 53% in Paraguay and Nicaragua, and have 33.2% on average.

The low reliability of the perceptual data may appear because of two reasons. First, citizens may report their general disaffection with elections caused by their dissatisfaction with government, the absence of viable alternatives among candidates, the inability of the democratic system to secure economic growth etc., instead of assessing the extent of electoral malpractice prevalence during election periods. Besides that, citizens as well as experts may be simply not aware of the actual extent of fraudulent practices and therefore exaggerate or underestimate the quality of elections due to their partisanship or exposure to particular media outlets.

Russian perceptions of electoral fairness are exemplary in this regard. First, the proportion of those who thought that the State Duma election took place honestly increased from 54% in 1999 to 83%[37] in 2007 (McAllister and White 2011), while quality of elections has evidently worsened in the 2000s. This discrepancy is partly explained by McAllister and White when they point out that "[h]ow Russians view the fairness of their elections is, then, very much associated with how they view their government as a whole" (p. 677). More precisely, perceptions of electoral fairness depend on trust in government and Putin's approval rate; that is also confirmed by Rose and Mishler (2009). Obviously, the vision of those who supported the current government was more myopic with respect to electoral fraud.

Various expert indices based on electoral observation reports also fall short of expectations. Although election observation organizations apply their own

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25% smaller if it is expressed as explained variance (R^2 = 0.64), whereas twice diminished correlation (0.4) is five times smaller if it is expressed as explained variance (R^2 = 0.16).

[37] Numbers are calculated excluding the category "Hard to say" from Table 3 in McAllister and White (2011).

methodologies, they typically observe the entire period of electoral campaign, including the pre-election period that induces them to virtually equate electoral fraud with the general bias of the electoral playing field. The qualitative nature of observer assessments appears when reports indicate the lack of transparency for observers, presence of ballot boxes outside polling stations or similar irregularities that do not necessarily lead to change in the number of ballots cast for candidates in the result (Hyde 2008: 204). Furthermore, as Hyde states even more plainly: "[m]any of their [short-term observers] observations are impressionistic and difficult to aggregate. Direct observations of vote buying or voter intimidation do not always form part of a larger pattern." (p. 208).

Instead of relying on general perceptions of electoral fairness, another stand of the literature overtly asks respondents whether they were witnesses of electoral fraud, more specifically, vote buying. Stokes (2005) and Nichter (2008) used the Argentine survey, which asked respondents whether they were recipients of goods distributed by a party during the last electoral campaign. Only about 7 percent of the sample acknowledged receipt of goods. Stokes admits that respondents may be hesitant to admit to having given in to vote buying because of the illegality or immorality of their actions or because they did not want to admit to being so poor as to have been attracted by miserable handouts (footnote 20 on p. 321).

Gonzalez-Ocantos et al. (2012) tried to solve the problem of social desirability bias by applying the list experiment technique. Results of the list experiment have shown that 24.3% of voters were offered a gift or favor on the eve of Nicaraguan municipal elections of 2008, whereas only 2.4% reported receiving personal gifts and 17.9% acknowledged neighborhood gifts, when asked directly. However, the results of list experiment are questionable for several reasons. First, all three measures of vote buying do not demonstrate any consistent pattern in factors determining distribution of gifts. Second, all models explaining vote buying have very small proportions of explained variance: 0.281 as a maximum and 0.023 on average. This leads to the conclusion that material inducements gauged by the list experiment or by direct questions are either distributed almost randomly or all three measures lack reliability.

Thus, expert indices and public opinion surveys generally do not measure electoral fraud directly but they rather capture the overall bias of the electoral playing field. Therefore, they allow answering the question about the role of electoral fraud in competitive authoritarian regimes only to a limited extent and as a rough approximation.

Allegations of Fraud

Allegations of fraud (usually submitted by opposition parties) are another proxy for electoral fraud. Lehoucq (2003) and Lehoucq and Molina (2002) used more than 1,300 individual accusations of ballot rigging presented in 123 petitions to nullify electoral results submitted to Costa Rica's unicameral Congress between 1901 and 1948 to identify electoral fraud. In a similar vein Ziblatt (2009) operationalized electoral fraud as incidences of parliamentary disputes over election legitimacy based on individual voter petitions charging election misconduct in Imperial Germany between 1871 and 1912. Similarly to reports on electoral malpractices issued by international organizations, this approach captures all violations of the electoral code rather than discrepancies between the voter's intention and official results. Moreover, as Lehoucq has noted, such accusations of fraud are presented by interested actors and may be intrinsically biased (2003: 234).

Ziblatt (2009: 8) also recognizes the possibility that bias may take place. To account for this, he uses two control variables: the difference in vote shares of the first two competitors, and the partisan makeup of the legislature and of the election dispute committee. Although these controls may be helpful to some extent, they can barely account for "the willingness to protest" since both represent the supply side. Petitions, however, are written by ordinary voters. A more proximate approach could be to control for partisanship of the petition complainants since voters identified with opposition parties are hypothetically more willing to write petitions than incumbent's party sympathizers. Especially in authoritarian regimes it may not be sympathizers of any particular party but rather strong opponents of the incumbent.

Meanwhile, allegations of fraud may be a fertile ground for bias even in democratic settings. Minnite (2010) examined several case studies of voter fraud allegations in the United States and found that spurious allegations played a strategic role in party combat. Spurious voter fraud allegations are primarily aimed at triggering electoral recounts and disputes to flip election results, but they also result in enacting restrictive electoral rules, which make voting harder for certain groups. The latter strategy, according to Minnite, is particularly used to keep down the black vote. Thus, allegations of fraud are therefore not neutral but rather politically motivated tools that cannot accurately account for a really existing amount of fraud.

Public Surveys

The next proxy for electoral fraud in non-democratic regimes is the level of political support measured via public opinion polls or exit polls. Hausmann and Rigobon (2011) analyzed the Venezuelan referendum of 2004. Using exit polls as an instrumental variable of the voter's intent, they calculated that it correlates with the official data at 0.91. This approach might arguably be correct in circumstances where any kind of pressure on pollsters is absent. On the other hand, in consolidated authoritarian regimes exit polls and public opinion polls may also be manipulated in favor of the incumbent. For instance, in the aftermath of the Russian 2011 parliamentary election exit polls reported 45.5% (FOM 2012) and 48.5% (VCIOM 2012) of votes for United Russia, having closely approximated to 49.3% announced by the Central Electoral Commission, whereas independent electoral observers who collected copies of polling station protocols reported that United Russia gained between 31.2% (Oreshkin, 2011) and 34.3% (RuElect, 2011) of the vote.

Other studies strive to control for social desirability bias that may appear in authoritarian context when respondents conceal their true vote intentions due to potential threats of punishment (if they prefer the opposition). Using the survey data collected by the polling organization Levada-Center before the Russian 2012 presidential election, Kalinin (Forthcoming) offered a measure of preference falsification calculated as a difference between the share of potential voters explicitly willing to cast their ballots for Putin and the share of potential Putin voters obtained from a list experiment. The average share of those who intended to vote for Putin, as measured by the list experiment, was expectedly smaller than both the average explicit vote intention and the official vote share for Putin (47%, 65%, and 64%, respectively). An analogous measure of preference falsification regarding turnout came up with a similar result. At the same time, a cross-regional analysis has shown a negative effect of preference falsification associated with turnout on explicitly intended turnout and various measures of electoral fraud[38]. Since this finding does not fit the theory, the author admitted that it requires

[38] The author used non-parametric regression to fit the models. Even though the coefficients are mainly significant, the effects are weak (0 – 5 percent in terms of R-squared): see Figure 5 and 6.

additional exploration, or the theory should be revisited. Two explanations can be offered for the absence of proper cross-regional correlation between the survey-based vote share (measured either as explicit vote intention or by the list experiment) and the official vote share. First, the Levada-Center sample may be not representative at the regional level. Second, the Levada-Center survey may generally not reflect true preferences of the respondents.

In their study of public support for Putin, Frye et al. (2017) ask whether suspiciously high Putin approval ratings are inflated because respondents are lying to pollsters. Using two Levada-Center's surveys of the early 2015, the authors found that Putin's popularity measured in a series of list experiments lays within 10-percentage point interval of that implied by direct questioning. More precisely, the average list experiment estimate appeared to be 7.5% smaller than the direct approval (87%).[39] Thereby, the article leads to the conclusion that Putin's approval ratings largely reflect the attitudes of Russian citizens. However, the research question can alternatively be formulated as whether suspiciously high Putin approval ratings are inflated because the polling agencies purposefully manipulate the data in order to oblige the authoritarian leaders in their attempts to convey the image of popularity with more impressive figures of public support.

Considering this explanation, Frye and colleagues note that "[t]his scenario seems unlikely, for while it is true that two of Russia's main polling agencies – FOM and VTsIOM – have close ties with the Kremlin, the third major polling agency in Russia – the Levada Center – is widely seen as independent, with a strong reputation for integrity and professionalism"[40] (p. 3). A similar reasoning is

[39] Calculated from Table 1 in the article as the mean values between surveys of January and March 2015.

[40] Choosing the most reputable agency could be a good rule of thumb under democracy. However, this can hardly be applied in authoritarian settings where the regime aspires to control all public forms of the opposition, acting on the principle "If you cannot prohibit them, lead them". By indirectly controlling the opposition, autocrats give voters, citizens, and observers an illusion of choice: they may choose between the worst option (the regime as such) and a "better", yet still bad option (candidates, parties, organizations, public opinion leaders, and other notables affiliated with the regime). Examples of this informal practice in Russia vary markedly from ostensibly opposition parties – CPRF, LDPR, and Just Russia – that imitate the opposition in the State Duma and ordinarily referred to as the "systemic opposition", to the so-called "non-systemic opposition" (also classified as semi-opposition – structural opposition and loyal – semi-loyal opposition (Gelman 2005)) on all wings of the political spectrum. On the liberal part of the spectrum, the Echo of Moscow is widely seen as an independent radio, which is prone to criticize the regime, in particular, it broadly covers electoral observation campaigns and post-electoral protests. The radio also gives the floor to several "non-system" oppositionists, including Alexei Navalny, who was described by the Wall Street Journal as "the man Vladimir Putin fears most" (Kaminski 2012). Notwithstanding, the Echo of Moscow belongs to the joint-stock company Gazprom-Media Holding, which is controlled by Gazprom, one of the largest state-owned enterprises. Along with another media channel – NTV, which is much more pro-official but also belongs to the Gazprom-Media Holding, the Echo of Moscow conveys slightly alternative (a "liberal") message from the same regime.

presented by Treisman (2011; 2014). Admitting that two out of three major polling agencies are affiliated with the Kremlin, the authors, nevertheless, do not see any oddity in the fact that "tied with" the Kremlin FOM and VCIOM agencies and the "independent" Levada-Center systematically publish quite similar ratings of public officials, and that these ratings are consistently close to official election results and do not make any "adjustment" for the level of electoral fraud. To justify Levada-Center's surveys, Frye and colleagues also note that Putin's high approval ratings are confirmed by polls carried out by Western researchers. They, however, pass over the fact that these surveys are done in collaboration with Russian polling agencies. Otherwise, it would be a technically difficult task to hire interviewers and manage a fully independent regional network of them from abroad. That way New Russia Barometer respondents are interviewed by the Levada-Center[41], the sixth wave of

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The symbiosis between the liberals, the "democratic nationalists" such as Navalny, and the regime became especially evident when Navalny – by the recommendation of Sergey Sobyanin, the mayor of Moscow and Putin's protégé – was granted at least 10 votes of United Russia municipal deputies (and 39 of other deputies) to be registered (but eventually lose the election) as a candidate at the post of Moscow mayor (Tsibulsky 2013) to enhance the regime's legitimacy, yet at the same time to increase his own popularity from 10% to 27.3% and to "become the sole undisputable leader of the opposition" (Gelman 2015: 184).

The Echo of Moscow also gave multiple opportunities to speak out to another radical oppositionist – Vyacheslav Maltsev – who publically called for a "Revolution of 5.11.2017". Maltsev organized and headed the "revolution" from a safe place in Europe because in June 2017 he left (or was allowed by law enforcement agencies to leave) Russia after he was accused of "creating an extremist community". Meanwhile, 448 ordinary supporters of Maltsev were detained; several of them were eventually prosecuted (https://ovdinfo.org/news/2017/11/07/sudy-nad-zaderzhannymi-vo-vremya-akciy-5-noyabrya-2017-goda). It was only the regime that derived (and could only derive) benefits from this action. The special services had a brilliant opportunity to create personal dossiers on the radical activists, recruit agents of them by threatening with criminal prosecution, and to dispel illusions of those who believed in easiness of regime change.

The popularity of Navalny, Maltsev, and other similar opposition leaders cannot be called an unpredicted or unexpected consequence of the regime's strategy toward the opposition. While such opposition leaders are sentenced to suspended or symbolically short prison terms that rather allow them to obtain an image of victims of the regime, and the regime and ostensibly anti-regime mainstream media both broadly cover these events, the most appealing, challenging, and therefore dangerous opposition leaders are sentenced to long and repetitive prison terms (so as colonel Vldimir Kvachkov), live abroad to avoid criminal prosecution for "extremism" under Article 282 (as Igor Artemov, the leader of the Russian All-National Union adjudicated to be an extremist organization) or they simply "do not exist" because they are not talked about in the mainstream media. In other words, based on maximal affinity and minimal potential threats, the regime selects and promotes those political activists whom it would like to see as the "opposition" and represses those opposition leaders who pose the greatest danger to the regime's survival.

The full picture of persons and organizations that collaborate with the regime is too wide to depict it here. It is also worth to briefly mention several persons from the left-nationalist spectrum – Nikolai Starikov, the leader of the Party of the Great Fatherland; Alexander Dugin, the national Bolshevik in the past, neo-eurasianist in the present; and a writer Alexander Prohanov – seeing the salvation of Russia in a person somewhere between Stalin and Putin. Thus, before choosing the most reputable person, party or organization positioned under the label of "independent", "opposition", "liberal", "nationalist" or whatever else, one ought to make a lot of effort to ascertain whether the label matches the actual content.

[41] Rose (2007: 101) overtly declares that the survey analyzed in his article "is the most recent, New Russia Barometer XV, in which a nationwide stratified random sample of 1606 adults was interviewed by the Levada Centre between 12 and 23 April 2007 (for full details, see Rose, 2007; www.abdn.ac.uk/cspp/)". See also: http://www.cspp.strath.ac.uk/catalog1_0.html

the World Values Survey was also carried out by the Levada-Center[42], and the European Social Survey is carried out by the Institute for Comparative Social Research[43].

Thus, studying political support in autocracies via public polls, scholars primarily see the problem in various aspects of social desirability bias but not in quality of surveys as such. Disregarding the obvious conflict of interests between polling agencies and the political regime, they do not attempt to investigate fraud in public opinion surveys under authoritarianism. This can be partially explained by the long history of trustworthy public polls in democratic countries. Researchers are disposed to trust in surveys in autocracies as far as they used to deal with high-quality surveys in democracies. The problem is aggravated in Russia due to change in political regime occurred in the 2000s: there is a temptation to believe that polling agencies remained as impartial in Putin's era as they were in the 1990s.

However, the equal treatment of public polls in democracies and autocracies can be misleading. Studying fraud through duplication in public opinion surveys, Kuriakose and Robbins (Forthcoming) found that in 10.1% out of 1,008 examined publically available surveys, the share of duplicated responses (identical observations) exceeds 10%. At the same time, the large proportion of duplicates (≥ 10%) was detected only in 2.0% of OECD countries (exclusively democracies) but in 15.3% of non-OECD countries (not necessarily but more probably autocracies). Needless to say that fraud in surveys may take multiple forms besides the duplication. The vast majority of these types of forgery, especially in authoritarian countries, are not examined so far. Unfortunately though, this area for research is rather unexplored when compared with electoral fraud studies.

Electoral Observation

Estimation of the actual vote share based on reports of electoral observers, especially if they are supplemented with copies of polling station protocols, is probably the most precise one in the group of observational data-driven methods. It allows for estimation of the amount of fraud in percentage units of measurement and thereby this kind of estimation is similar to distribution-based methods. Enikolopov et al. (2013) have estimated the actual share of United Russia's vote in

[42] See release notes for Russia at: http://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp

[43] The institute has its own network of regional interviewers and does not hire subcontractors for the survey – was responded by Anna Andreenkova, the director of the ESS project in Russia, on the author's demand. See also: http://www.cessi.ru/index.php?id=142

the 2011 parliamentary election to be 10.8 percentage points lower than the official vote tally in the city of Moscow (36% instead of 47%).

Meanwhile, the precision of electoral observers' reports is crucially dependent on the degree of regime permissiveness regarding electoral monitoring and on the level of competence of observers. It is no secret that more closed regimes prohibit the activity of independent observers and even manage to substitute them with obedient ones who are controlled through the party structure and rewarded with cash payments or with other tangible benefits. Election monitoring, on the other hand, is not a simple mission. Observers must be sufficiently trained and qualified to detect fraud during the voting process, for instance, in the moment of stuffing the ballot box or during the vote count when, for example, votes in violation of the procedure are counted simultaneously for all candidates without demonstrating each ballot for checking up. An unprepared or unwilling observer may not even notice the full set of fraudulent actions perpetrated by members of the electoral commission.

This might be one of the reasons why Bader and Schmeets (2013) found that the presence of electoral observers in the Russian 2012 presidential election helped to detect and deter fraud only to a limited extent. The incumbent's vote share at polling stations visited by observers of the OSCE mission during the process of voting was 59.1% compared with 60.4% at polling stations without observers, while the vote share at polling stations visited during the vote count amounted to 55.6% compared with 58.7% without observers. The difference in incumbent's vote share between positively and negatively assessed polling stations during voting does not exceed one percentage point. Meanwhile, the qualitative assessment of observers who visited polling stations during vote count gives a difference of nearly four percentage points. The corresponding estimates for the 2011 parliamentary election follow a similar pattern: there is a small difference between polling stations with and without observers and these estimates, even considering the fact that the sample is biased in favor of the less fraudulent regions, deviate from official vote shares by very few percentage points.

It should be noted that Bader and Schmeets used the very fact of the presence of electoral observers at the polling stations but not tallies from polling station protocols reported by observers. In a similar vein, Sjoberg (2012) found only a modest effect of election observation on incumbent's vote share in Azerbaijan, Kyrgyzstan and Georgia. All these countries vary markedly by type of their political regimes, however, in each case the difference between groups of polling stations with and without electoral observers falls within one and two percentage-point intervals regarding vote share and turnout, respectively.

Evidently, political leaders – especially in polities of uncertain type (where it is unclear whether they are democratic or authoritarian) – invite international election observers and cheat in front of them, in attempt to gain international legitimacy (Hyde 2011). For this reason, election observers' data cannot be fully reliable, yet it may be used as one of the instruments in studying electoral fraud.

Electoral Data-Driven Methods

Sample-Based Methods

There is a class of methods that use electoral results in a particular territory, specific polling stations or in comparable previous elections, which are assumed not to have been exposed to fraud, as the reference category to be compared with presumably fraudulent territories, polling stations etc. Sample-based methods, like experimental methods, thereby virtually split the sample into a treatment group (accused of fraud) and a control group (presumably free and fair). In a simple form it may be a comparison of ordinary polling stations and polling stations with electronic vote counting machines (Buzin and Lubarev 2008: Ch. 8.5) or a comparison of polling stations with high and low levels of invalid ballots (Buzin 2008). As Buzin shows, electronic vote count considerably decreased incumbent's vote share in the Russian presidential election of 2008 in Moscow, whereas smaller proportions of invalid ballots correlated with higher proportions of votes cast for Medvedev. Analyzing Russian elections Lukinova, Maygkov and Ordeshook (2011) employed a similar approach by splitting the sample into different regions of Russia – *oblasts* and *republics*. Their analysis reveals that ethnically dominated republics are characterized by higher levels of pro-incumbent voting.

Not always, however, a comparison between several datasets leads to detection of fraud due to reasons beyond capacity of the methods but rather due to selection of irrelevant cases. Hood and Gillespie (2012) tried to discover the incidence of voting by deceased voters during the 2006 general election in Georgia. They compared voter information between a voter registration database and a listing of decedents in the corresponding counties of Georgia. As a result, 5,225 deceased registrants out of more than five million registered voters were detected.

Nevertheless, a further exploration revealed that only 66 of them have supposedly cast their votes, while 51 of these 66 registrants' ballots had been returned to the county prior to the date of death, in six cases registrants made a request for an absentee ballot also prior to the date of their death, four cases were cleared as being mistakes, and only five votes remained questionable since the county registrars failed to respond to the requests.

More complex versions of the sample-based approach rely on regression models. The analysis by Alvarez and Katz (2008) is focused on the Senate and gubernatorial 2002 elections in Georgia. To test whether a concern that electronic voting systems adopted in the state's counties worked in favor of Republican candidates is justified, the authors constructed two forecasting models in which the Democratic vote in the Senate and gubernatorial elections of 1998 is regressed on the past vote in the 1996 presidential election and on the percentage of county's non-white population. The estimates from 1998 then were used to predict the 2002 Democratic vote. In the gubernatorial election, 42 negative errors were detected indicating that the Democrats did worse in the election, while all 34 errors in the Senate election were positive. Although the results show that the elections of 2002 are systematically different from the past elections, the authors argue that the theoretical expectations of fraud are not confirmed since the bias has an unexpected direction. However, the study has not examined whether the outliers represent counties with electronic voting systems or not. It should be also remarked that for method-building and method-testing purposes, highly suspected of fraud cases should be preferred over ambivalent cases. In this regard, electoral autocracies are a better training field for testing the methods of electoral fraud detection than electoral democracies.

Myagkov, Ordeshook and Shakin (2005; 2007; 2008; 2009) offered an "ecological method" for investigating the "flow of votes" between elections. They assumed that vote share received by a party or a candidate from another party or candidate as the result of changes in voters' preferences between elections cannot be lower than 0% and higher than 100%. In case of fraud this rule is violated. Generally the authors found that coefficients of the flow of votes to United Russia and Putin exceeded 1 in the elections of the 2000s. In Ukraine the flow of votes to both the incumbent and the opposition has suspicious coefficients (2009: 160). However, applying this method to the Moscow State Duma election of 2003–2005 and to the election of Novosibirsk city legislature of 2003–2005 the authors found relatively small amount of fraud compared with simulated data (2009: Ch. 2.7). This method has also been applied to the Venezuelan referenda of 2007–2009. In this case the overall coefficients of the flow of votes from supported *yes* and *no* alternatives to the corresponding options between the referenda were about 1, with several exceptions such as the Pedernales municipality of Delta Amacuro where the proportion of the 2007 *yes* share received by the *yes* alternative in 2009 was equal to 146 percent (Levin et al. 2009).

Several points should be outlined in relation to this approach. First, the authors establish equal conditions for the flow of votes from one candidate to another and for the flow of votes of the same candidate between elections. In the first case the established interval [0, 1] is reasonable, while in the case of flow of votes to the same candidate an expected equation would be the following: $V_t = \beta_0 + 1 \times V_{t-1}$, i.e., the candidate should receive almost the same proportion of votes plus or minus some β_0, which ordinarily approximates the change in the vote share between elections at the national level. In particular, Myagkov, Ordeshook and Shakin (2005: 109) wonder that Putin in 2004 received 114% of the votes cast for United Russia in 2003 and attribute it to forgery. However, given the fact that Putin's and United Russia's electorate is almost a single entity, the β_1 = 1.14 should rather be interpreted so that the most supportive United Russia's electorate of 2003 became a bit (14%) more supportive when it voted for Putin in 2004. Second, strongly negative coefficients of the flow of votes of *the same* candidate from one election to another may not necessarily result from fraud. The negative coefficient may appear if a candidate loses his strong constituency, which may, for instance, be tied by ethnic identity. In this case those who were the most supportive in the past election will be the least supportive in the present, and the contrary is true for his opponent who takes over the support of the core constituency. Third, the method does not allow for estimating quantitatively the number of falsified votes. Finally, the flow of votes may make little sense if comparing two fraudulent elections.

Another kind of ecological approach has been presented by Leemann and Bochsler (2014). They analyze the Swiss referendum of 2011 where 30 municipalities irregularly destroyed the ballots and found that these municipalities reported 0.2–1.4% fewer blank ballots than other municipalities. Considering that the tie-break question was decisive for defining the referendum's outcome, illegal converting of blank ballots into the "Parliament bill" or "People's amendment" votes could have altered the election. However, lost ballots are statistically non-significant in predicting the referendum results for these variables (see Table 4 on p. 44 in the article).

Nevertheless, even if the correlation between blank ballots and votes for one of the referendum's alternatives existed, one question would still remain salient. Applying sample-based approaches does not protect us against the risk of spurious correlations caused by the absence of important variables in the model's specification. For example, we may assume that invalid ballots[44] are systematically counted as Putin's ballots. This looks plausible since the OLS model predicting Putin's vote share in 2012 depending on the number of invalid ballots has R-squared = 0.126, constant = 0.706, beta = -0.0043, and standard error = 0.000037; N of observations = 95,412. Hence, if the number of invalid ballots is shifted from the 5th percentile (0) to the 95th percentile (27) Putin loses 11.60–11.62% of the votes. Indeed, in relatively fraud-free Vladimirskaya Oblast the median number of invalid ballots equals 7 and Putin's vote share equals a moderate 55.76%; in Chechnya the median number of invalid ballots descends to 1 and Putin's vote share bumps up to an incredible 99.94%. This conclusion is obviously misleading. Even 27 blank ballots (the 95th percentile) illegally assigned to Putin cannot increase his vote share by 11.6%. Since the median number of Putin's votes equals 417 and the median number of valid votes equals 641, 27 additional ballots may yield only a 1.4 percentage-point increase in the vote[45], on average. Evidently, in this case, other variables (types of fraud) intervene and impact Putin's vote share. Invalid ballots are merely collinear to these more influential types of fraud.

Electronic voting seems to be reasonably used for subsampling in a sample-based approach (Kobak, Shpilkin and Pshenichnikov 2012: 4). It may even be advocated as a toolkit against fraud. On the other hand, electronic voting systems raise serious security concerns (Kohno et al. 2004; Bannet et al. 2004; Wolchok et al. 2010). On this premise, electronic voting in authoritarian context may also contribute to legitimizing successfully falsified elections. To demonstrate this, Table 3.1 shows the difference between polling stations with and without electronic vote count for the Russian presidential election of 2012. As follows from the table, electronic vote count indicated by Optical Scan Voting Systems (KOIBs) and Electronic Voting Systems (KEGs)[46] indeed comes up with Putin's vote share that is by 4.5% smaller than indicated by the overall vote count. The turnout rate is also

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[44] Invalid ballots in Russia include blank ballots and ballots where more than one candidate is chosen; the separate count of blank ballots is not performed.

[45] Calculated as the difference between the average vote share (417 / 641 = 65.1%) and the vote share altered by 27 ballots ((417 + 27) / (641 + 27) = 66.5%).

[46] For more details of functioning of KOIBs and KEGs see presentation of the Russian Center for Training in Election Technologies under the CEC of Russia (in Russian): http://www.rcoit.ru/shk_uik/presentation/7_1.swf

smaller in polling stations with electronic vote count by 5.5%. This supports the hypothesis that electronic vote count counteracts fraud.

It might be argued, however, that the results are biased since electronic vote count may not be randomly distributed across polling stations.[47] To control for this, Table 3.1 also reports statistics for other polling stations (with the ordinary procedure of vote count) within the same territorial electoral commissions (TIKs) having precinct electoral commissions (UIKs) with KOIBs and KEGs. The difference in the average vote share and turnout between UIKs with electronic vote count and other UIKs within the same TIKs is even larger – 9.2% and 5.9%, respectively. In other words, UIKs with electronic vote count were rather located in TIKs the level of Putin's vote (or fraud) in which was even higher than the average (see also Appendix C1 for the region-level statistics). Hence, we may suppose that if the level of Putin's vote (or fraud) in TIKs with electronic vote count had been the same as the average, KOIBs and KEGs would have registered even a more modest result for Putin.

Table 3.1. Descriptive statistics for polling stations with electronic vote count and without from the Russian presidential election of 2012

	Overall		KOIBs & KEGs		Other UIKs in TIKs with KOIBs & KEGs	
	Putin V_i^I/V_i	Turnout	Putin V_i^I/V_i	Turnout	Putin V_i^I/V_i	Turnout
Average[a]	63.28	67.82	58.86	62.34	68.02	68.19
Std. Deviation[b]	9.16	9.0	9.75	9.92	11.76	10.71
5th Percentile[b]	47.94	58.83	48.45	55.6	48.96	55.27
95th Percentile[b]	83.3	89.8	81.42	87.05	92.26	91.42
N of UIKs	95413	95414	4970	4971	22665	22665

Note: a. Average values represent the ratios of total votes expressed in percentage points. For example, Putin V_i^I/V_i in KOIBs and KEGS is calculated as a ratio of Putin's votes in the group (3,106,583) to the number of valid votes in the group (5,277,856). b. The statistics represent cross-regional variation (in %). The number of cases in the Overall group is equal to 83; N in the other two groups is equal to 71 (the number of regions in which electronic voting systems were installed). KOIB denotes Optical Scan Voting System, KEG denotes Electronic Voting System. KOIBs and KEGs are merged since only 268 KEGs were used in

[47] It can be also hypothesized that more electronic vote counting machines are installed in regions where Putin's vote is typically higher to artificially inflate the average. I dwell on this question in Appendix C1, which shows that KOIBs and KEGs are distributed randomly regarding the number of UIKs and the number of eligible voters in TIKs. However, the proportion of UIKs with electronic vote count in TIKs tends to decrease as the share of incumbent's vote increases, i.e., TIKs include too few UIKs with electronic vote count in areas where fraud is more probable (6% in Bashkortostan, 7% in Ingushetia, 9% in Dagestan, 11% in Tatarstan, whereas the national average is equal to 28%).

the election. Data on KOIBs and KEGs are available at: https://docs.google.com/spreadsheet/ccc?key=0AiFMnUnpIlridDRUck03WVBKOEp6UFVmZVRvOUNXUGc.

Despite the general difference between polling stations with and without electronic vote count, tallies from KOIBs and KEGs from several regions with strongly manipulated elections do not differ substantively from tallies of precincts within the same TIKs but without electronic voting (see Appendix C1). In Tatarstan, this difference in Putin's vote share is equal to 0.4% and the average vote share in both types of polling stations is too high to bee trustworthy (94.8% in UIKs with electronic vote count and 95.2% in UIKs without electronic vote count within the same TIKs). In Dagestan, Ingushetia, and Karachay-Cherkessia, the difference is larger (9.2%, 11.7%, and 9.7%, respectively) but the vote shares in UIKs with electronic voting are still too high (84.4%, 80.8%, and 82.4%, respectively). The fact is that electronic vote count may inhibit fraud but cannot eliminate it completely. Moreover, ballots can be stuffed in a KOIB just as they might in a standard ballot box (although, in the first case ballots cannot be inserted by a pile in one stroke). One person can vote for several voters by using various barcodes for a KEG. And, finally, members of the polling station commission may report fictitious numbers to the upper-level electoral commission that, in its turn, may also be engaged in manipulation with numbers.

To sum up, sample-based methods have a common shortcoming since they are based on the assumption that the subsample used as the reference category is not impacted by fraud. This assumption, however, does not hold if elections are forged systematically. Therefore, without having definite knowledge about the distribution of fraud in data, the application of a sample-based approach may result in a split on highly fraudulent and less (but still) fraudulent observations with all the consequences that it entails.

Digit-Based Methods

The method of electoral fraud forensics that has recently attracted scholars' attention is based on Benford's law of the distribution of digits in numbers. The method utilizes human bias in generating numbers and assumes that intervening in the voting process causes numbers to deviate from the theoretically expected distribution. Real-world probabilities, according to Benford's law, take the shape of the inverse logarithmic function that for the first digit (j = 1, 2, 3,... 9) has the following values: 0.301, 0.176, 0.125, 0.97, 0.79, 0.67, 0.58, 0.51, 0.46. For the second digit (j = 0, 1, 2,... 9), the probabilities are the following: 0.120, 0.114, 0.109, 0.104, 0.100, 0.097, 0.093, 0.090, 0.088, 0.085. For the third and subsequent digits, the predicted probabilities are close to the probabilities of the last digit, for which the distribution is uniform with probability 0.1 for each j = 0, 1, 2,... 9. The model fit for a single number could be estimated by a non-parametric chi-square test or by using an AVOVA test for a set of numbers. Another approach is to model the fit of the observed mean value and its predicted probability. According to Benford's law, the predicted probability for the mean of the first digit equals 3.440 and that for the second digit is 4.187. If data originate from a natural process and have not been exposed to fraud, the observed and predicted probabilities should not deviate significantly.

Scholars have applied this method to elections in Afghanistan (Weidmann and Callen 2013), Argentina (Cantú and Saiegh 2011), Russia (Mebane and Kalinin 2009, 2010; Mack and Shikano 2013; Skovoroda and Lankina 2017), Sweden, Senegal and Nigeria (Beber and Scacco 2012), the United States (Mebane 2006; 2008), the U.S., Puerto Rico and Venezuela (Pericchi and Torres 2011), and Venezuela (Levin, Cohn, Ordeshook and Alvarez 2009). Yet several studies have come to conclusion that the discrepancy of data with Benford's law does not allow to verify fraud with certainty. Using simulated data, Deckert et al. (2011) have shown that the mean values of second digits vary in between theoretical expectations of Benford's law for the 2nd significant digit (2BL) and Benford's law for the last digit (LBL). Out of the 36 means, fourteen appeared to be closer to the expected mean of the LBL (4.5), thirteen fell below the 2BL requirement (4.187) and three were less than 4.0. Moreover, means were sensitive to the precinct's population and the candidate's vote share. In the end the authors categorically concluded that "Benford's Law is wholly irrelevant to assessing an election's conformity with good democratic practice". Applying 2BL to allegedly fraud-free elections in France and suspected fraudulent elections in Russia, Mack and Shikano (2013: 16) came to the straightforward conclusion that "2BL test is inappropriate for detection of election frauds". Although 2BL statistics for both Russian elections exceeded critical values, χ^2 statistics for two candidates in the 2012 French presidential election, namely Le Pen and Bayrou, were also above the level of tolerance. Mebane (2010: 26) was more moderate in his conclusions regarding performance of the 2BL tests: "tests can sometimes distinguish the effects of coercion – where votes are cast regardless of preferences – from the effects of strategic voting and gerrymanders".[48]

The failures of the digit tests applied to the first (and similarly to the second) significant digit can be explained by at least two reasons. First, any data can be expected to fit Benford's law for the first (and second) significant digit only if a higher probability of number 1 is causally determined along with a decreasing probability of each subsequent number in consecutive order. For example, we may expect the order of clicks in a search engine to be distributed according to Benford's law since the first link is located closer to the search box, the second link is more

[48] Several other studies are positive regarding applicability of Benford's law to the first digit (1BL) and 2BL for detecting vote irregularities. However, these studies are generally inconclusive. The studies of Cantú and Saiegh (2011) and Montgomery et al. (2015) are built upon a combination of digit-based and sample-based methods. Although the authors resort to substantively different reference datasets, the key assumption of sample-based methods (that the reference dataset is free of fraud or defines fraud with certainty) is violated in both cases. Cantú and Saiegh (2011) used a simulated dataset to train a naive Bayes classifier and then apply it to Buenos Aires' elections of 1931–1941. The training dataset includes vote counts of parties A and B generated based on Benford's law probabilities and fraudulent vote counts for these imagined parties. Disregarding a human bias in number generating process, the number of stolen votes was defined as a product of party A's votes and a constant of 0.3; the observations affected by fraud were also selected at random by random generation of the binomial distribution (see Appendix 1 in the article). As if follows from Figure 2 and 4, the probability of number 1 (0.44) increased in the falsified compared with the initial distribution (0.29) and the 1BL (0.3) and the first-digit mean shifted toward the first number (0.27) compared with the initial distribution (0.34) and the 1BL (0.34). This change, however, occurred only occasionally when the mean N of party B's (the beneficiary of fraud) votes enlarged to about 1500 from the initial 1200 in the result of simulated fraud, thereby having magnified the N of observations starting with 1 by allowing several observations with party B's votes < 1000 to pass this threshold. Appealing to the historical wisdom regarding the quality of elections in the Argentina's "infamous decade", Cantú and Saiegh assert that their method better predicts (in binary terms: whether fraudulent or not) the outcomes of the four elections in Buenos Aires than other fraud detection techniques. This assertion evidently overemphasizes the quality of the historical electoral observation as a proxy to fraud and overstates appropriateness of the sample of elections as a ground for comparison. Furthermore, the probability of number 1 in supposedly fraudulent Buenos Aires' *partidos* (0.39) appeared to be unexpectedly lower than the probability in the cases where no irregularities were uncovered (0.44) and both considerably exceed the 1BL expectation (0.3); the first-digit means in the fraud-alleged (3.12) and fraud-free (3.61) cases also diverge from the 1BL expectation (3.44).
Montgomery et al. (2015) used qualitative assessments of electoral quality from National Elections Across Democracy and Autocracy (NELDA) dataset in seventy countries over six decades as an explicit measure of likely fraud to diagnose fraud by deploying a Bayesian additive regression trees (BART) model, which includes forensic indicators of anomalous vote count distributions (the 2BL and LBL chi-squared statistic, the mean of the second digit, and the mean distance between the last pair of digits) and contextual risk factors (economic inequality, ethnic fractionalization, urbanization, district magnitude, turnout, regime type, and others) as predictors. The results of the BART analysis show that variation of the measure of fraud derived from NELDA dataset is better explained by a combination of both forensic indicators and contextual risk factors. However, BART is a nonparametric Bayesian regression that does not estimate coefficients and their significance levels (a rational of using BART instead of other regression models conventionally used in such cases is not discussed by the authors). Figures 3 and 4 in the article rather indicate that most variables' effects are either ambiguous or insignificant, at any rate, the effects are small. This fact underlines a distinction between observational and electoral data-driven methods of electoral fraud detection and stresses the importance of the main assumption of sample-based methods: the training dataset should ideally differentiate cases of electoral fraud with certainty or to maximize the probability of this distinction by all possible means (yet only 23 cases out of 586 in the sample are coded as autocracies based on Polity IV score that decreases a theoretical probability of fraud to merely 4%), otherwise robustness of the method inevitably suffers.

distant, and there are very few (if any) of those who want to see the links on the last page of a search output. Put bluntly, we do not have such theoretical expectations for electoral data. Second, the number of votes received by a candidate (and consequently its leading digit) depends on the number of eligible voters and on the level of electoral support of the candidate. For instance, the distribution of a candidate's votes who received 50% of the vote in a ward with the mean number of eligible voters = 3,000 and 67% of turnout rate is more likely to match Benford's law, since the mean number of the candidate's votes is concentrated around 1,000 (having the leading digit = 1, on average). In contrast, a ward with the average of 2,000 eligible voters, 50% of turnout rate, and 50% of a candidate's vote share would have the average leading digit equal to 5, therefore indicating a sharp deviation from the predicted probabilities. Thus, first-digit and second-digit Benford's law is hardly appropriate for electoral fraud forensics (see also Diekmann 2007).

Meanwhile, the application of Benford's law to the last digit is more promising. Scholars proved that zeros in Nigerian and Senegalese electoral data (Beber and Scacco 2012) as well as zeros and fives in Russian election returns (Mebane and Kalinin 2009) are observed too frequently in the last-digit distributions to be considered as the result of a fair electoral process. Christensen (2012) has modified the method of Beber and Scacco. He used the share of factors of 10 (10, 20, 30...) for the last digit as an indicator of fraud in the Afghani presidential election of 2009. The application of the LBL to a more competitive environment expectedly produced modest results. As Leemann and Bochsler (2014: 44) showed, the hypothesis of fraud is confirmed only in one out of six tests of voting in the Swiss referendum of 2011. The absence of empirical confirmation of theoretical expectations impelled the authors to question whether the test is valid.

Since theoretical expectations regarding the distribution of digits are not always clear (whether a uniform of an inversed logistic), Meyersson (2015) presented a combination of digit-based and sample-based approaches. He compared the last digit distributions of vote counts for the major Turkish parties between two Turkish general elections conducted in June and November 2015. He found that for all parties, except the main opposition Republican People's Party (CHP), last digit distributions statistically differ between two elections; that the distribution of digits for the ruling Justice and Development Party (AKP) is statistically indistinguishable between the elections in stronghold provinces of the Nationalist Movement Party (MHP); and that only Peoples Democratic Party's (HDP) distribution of digits is statistically different between the elections in the five most populous provinces. Discussing this result, Meyersson points out that validity of the tests is based on the assumption that the election of June 2015 was not affected by fraud. It should be added that, commonly to all digit-based methods, the relationship between statistical and substantive significance is not obvious. Even having a statistically significant result, there is not a simple task (if resolvable at all) to define whether the detected forgery altered the election outcome (as in the case of AKP's gain of votes, for example) or changed vote proportions just slightly.

This limitation appears from two shortcomings of digit-based methods. First, as discussed earlier, the predicted probabilities of digits do not necessarily (neither theoretically nor empirically) match Benford's law probabilities; there is no solid ground to consider that they should be uniformly distributed also. Second, studies typically report chi-squared statistic for digit tests that is not informative in quantitative terms, i.e., it is not comparable with percentage points – the units of measurement of votes. Medzihorsky (2015) tries to solve these problems by offering two measures allowing to estimate the share of deviating observations (the π^* mixture index of fit and the Δ dissimilarity index) and by employing log-linear models for comparing several subsets of the data in order to relax distributional assumptions. While the π^* mixture index of fit measures the distance between the least digit's probability and 0.1, and therefore is not reliable due to the dependence on a single the most deviating digit, the Δ dissimilarity index is more promising since it accounts for the sum of absolute deviations of the observed densities from 0.1 divided by a doubled number of digits (i.e., by 20).

Using the data of Beber and Scacco (2012), Medzihorsky estimated that under the relaxed distributional assumption only one percent of observations (with regard to the Δ dissimilarity index) need to be reallocated for perfect fit between two Senegalese presidential elections of 2000 and 2007. This finding puzzled the author because high prevalence of fraud was reported by observers in the second case but not in the first. One suggested answer was that "the distribution of last digits is not informative with regard to the presence of fraud" (p. 515) "since digits can easily be distributed the same way in fraudulent and fraud-free results even if the fraudsters do not deliberately attempt this" (p. 516). This conclusion evidently comes from disregarding the prime assumption of sample-based methods, namely, that the reference subsets in the data must be free of fraud, and from undue reliance on electoral observation as a method for detection of electoral fraud[49]. Therefore, the second proposed explanation seems more feasible: "the relaxed distributional assumption is inadequate" (p. 516).

It should be noted that performance of Medzihorsky's Δ dissimilarity index as well as of other digit tests may be dependent on the number of cases. Analyses of digits are ordinarily implemented at the national level, yet few studies that carried out the analysis by several jurisdictions (Beber and Scacco 2012; Leemann and Bochsler 2014: Appendix; Meyersson 2015) show that the distribution of digits tends to be more dispersed (i.e., to a larger degree deviating from predicted probabilities in both directions) at lower levels of data. This may occur for two reasons. First, the deviation of digits naturally increases as the sample size is getting smaller. Second, the deviation of digits may decrease in the result of aggregation of even fraudulent data if human bias affects frequencies of digits at random throughout lower-level jurisdictions.[50] To disentangle whether this larger variance at lower levels of data comes from a smaller number of cases or from electoral fraud, Table 3.2 reports last-digit frequencies of the Social Democratic Party (SAP) vote count in 25 Swedish counties (län) from the 2002 parliamentary election. Following Beber and Scacco (2012), I suppose that this election was free of fraud and that only the number of cases can influence the deviation of last digits by counties[51].

[49] Shortcomings of electoral observation techniques were discussed earlier in the section "Electoral Observation". It can be added that the Russian presidential election of 2008 was more qualitatively and quantitatively fraudulent than the election of 2012. Nevertheless, the regime was stronger in 2008, few independent observers monitored the election, incumbent's dominance was not in doubt and all interested actors generally accepted the outcome of the election. Incumbent's position was not so stable in 2012. For this reason, much more observers were engaged in the electoral process, more powers tried to put the election outcome under question by appealing to electoral monitoring. Therefore, the evidence of fraud became widely available and created a very unclean image to the election of 2012, though the election of 2008 would have looked much more "dirty" if these actors had been as active in 2008 as they were in 2012.

[50] Appendix C2 shows that this statement is not confirmed in the case of the Russian 2012 presidential election, while the relationship between the standard deviation of the last digit and the number of observations is strong and exponential at the regional level.

[51] This solution is only partial. For better controlling for electoral fraud, more elections (both expectedly fraudulent and fraud-free) should be considered with modelling the relationship between the number of observations and chi-squared or similar statistic in different types of elections. See also Appendix C2 for last-digit distributions of Putin's vote count and vote share in Russia's regions from the 2012 presidential election as a case of fraudulent election.

Table 3.2. Last-digit frequencies of the SAP vote count in 25 Swedish counties from the 2002 parliamentary election compared with Benford's law

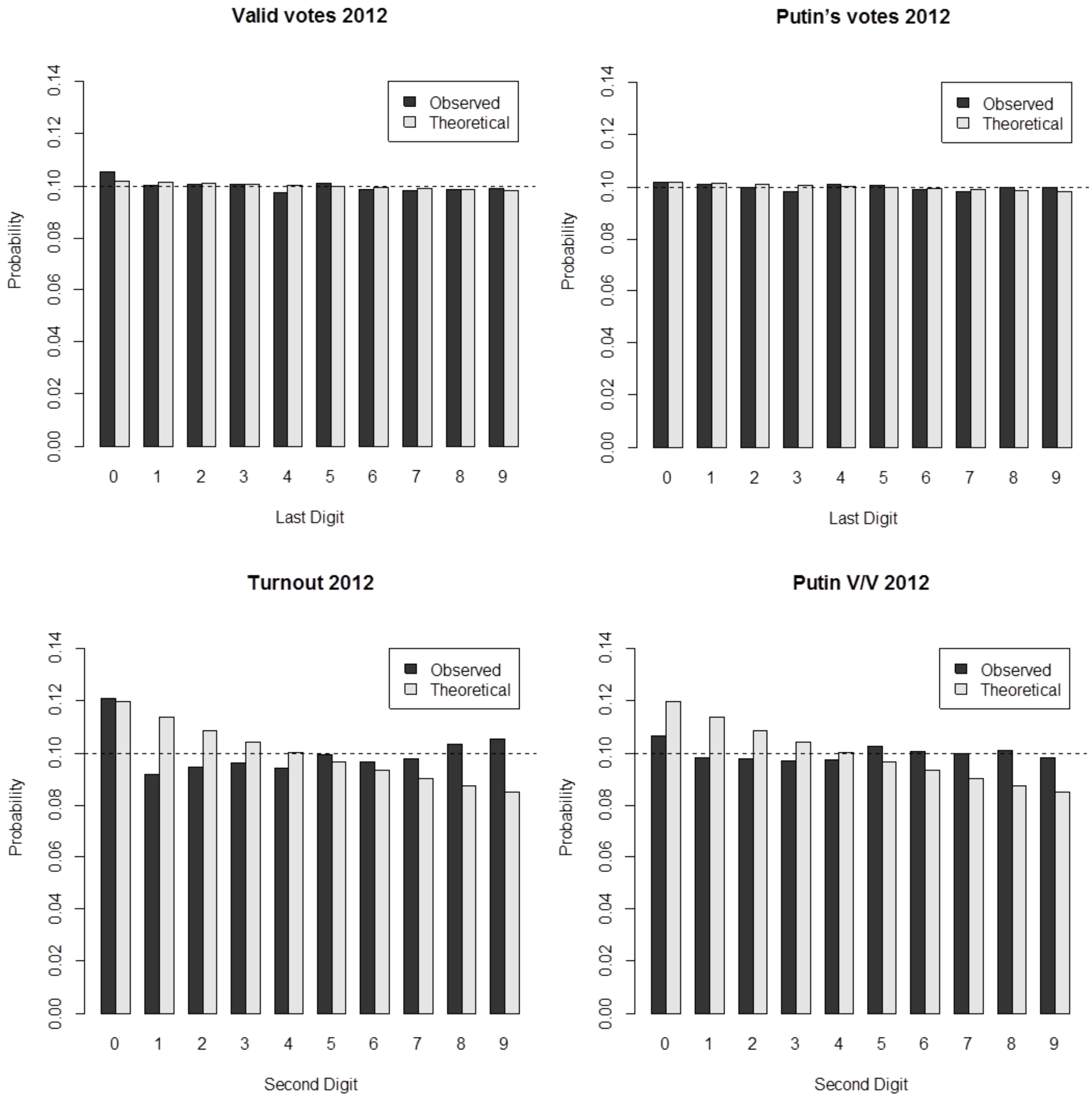
Län	Last Digit 0	1	2	3	4	5	6	7	8	9	Total	SD, %	Δ, %	χ^2_{LBL}
1	102	124	111	118	114	106	113	85	90	113	1076	1.1	.44	12.5
3	14	21	23	20	14	22	16	14	17	19	180	1.9	.83	6.0
4	24	14	18	17	20	10	9	23	13	17	165	3.1	1.21	14.0
5	27	26	35	24	34	18	31	30	30	23	278	1.9	.76	8.9
6	21	20	22	26	23	29	23	19	29	28	240	1.6	.67	5.3
7	13	17	17	19	13	12	16	12	13	15	147	1.7	.71	3.7
8	23	15	22	17	18	18	13	12	21	19	178	2.1	.8	6.8
9	2	4	4	3	1	8	6	6	3	2	39	5.6	2.18	11.0
10	12	11	13	6	9	7	14	6	10	11	99	2.9	1.17	7.4
12	78	74	74	86	75	85	62	74	77	54	739	1.3	.43	11.3
13	17	20	20	18	13	17	16	12	20	15	168	1.7	.67	4.4
14	102	78	104	94	119	96	112	108	104	92	1009	1.1	.43	11.9
17	20	18	27	16	29	21	25	19	19	22	216	1.9	.77	7.2
18	29	22	20	20	11	16	20	17	21	26	202	2.5	.85	11.3
19	13	15	7	17	15	14	22	13	16	21	153	2.8	.97	10.6
20	19	17	27	17	10	21	23	21	19	22	196	2.3	.82	9.3
21	21	10	22	16	24	13	22	24	18	21	191	2.5	1.02	10.6
22	18	17	12	19	15	26	17	18	14	22	178	2.2	.79	8.1
23	11	17	6	9	11	10	16	14	14	9	117	3.0	1.21	9.2
24	19	25	20	22	17	9	16	17	15	15	175	2.5	.91	9.9
25	27	26	20	24	22	19	25	21	24	22	230	1.1	.48	2.7
Med.	20	18	20	19	17	18	20	18	19	21	20	2.1	.8	9.2
Tot.	612	591	624	608	607	577	617	565	587	588	5976	.3	.13	5.4

Note: SD is the standard deviation of probabilities (frequencies are converted into probabilities for this statistic). Δ denotes the Δ dissimilarity index (Medzihorsky 2015). The SD and the Δ index are expressed in percentages (i.e., multiplied by 100). χ^2_{LBL} denotes chi-squared statistic for the last digit, where all digits' expected probability, according to Benford's law, is equal to 0.1. Data source: Beber and Scacco (2012); available at: http://hdl.handle.net/1902.1/17151. All chi-squared statistics do not reach even 10%-level of significance (14.68 at 9 degrees of freedom).

As appears from Table 3.2, fraud is not detected in any county: chi-squared statistics are insignificant in all cases. At the same time, we can notice a 1.7-fold difference between the median χ^2 (9.2) among 25 counties and χ^2 at total (5.4). However, there is no substantive relationship between chi-squared statistic and the number of observations: a positive correlation (.399, significant at .07) appears mainly from three cases where N > 700. The situation is different with Medzihorsky's Δ dissimilarity index. Not only the median Δ index (0.8%) is nearly six times larger than the Δ index at total (0.13%), but also the Δ index is strongly and negatively dependent on the number of observations (Pearson correlation coefficient (-0.575) is significant at 0.006). This is especially evident looking at counties with the largest and smallest number of observations. The largest share of fraud (2.18%) is detected in the 9th county (39 observations), 10th (1.17%, 99), and 23rd (1.21%, 117) counties, respectively. In counties (1st, 12th, and 14th) with the largest number of observations (1076, 739, and 1009) the share of fraudulent observations does not reach even half a percent (0.44, 0.43, and 0.43 percent, respectively). In this regard, the Δ dissimilarity index is substantively similar to the standard deviation (SD) of digit probabilities. The SD indicates that distributions of digits at the level of counties are 6.5 times more dispersed (2.1%) compared with the distribution of the pooled data (0.3%). The correlation between the SD and the number of observations is also negative (-0.553, significant at 0.009).

Hence, last-digit distributions in fact tend to be larger at lower levels of data. Chi-squared statistic adequately treats this relationship by taking the number of observations into account, yet the cost of this adjustment is a binary assessment of election data (whether the election is fraudulent or not at a conventional level of statistical significance) with fundamental impossibility of quantitative estimation of the amount of fraud since the same size of deviations from predicted probabilities produces different statistic depending on the number of observations. The Δ dissimilarity index (in absolute values) and the SD (based in squared deviations) measure the share of fraudulent observations, however, potential utility of these and similar measures is greatly deprecated by variability of last-digit probabilities caused by factors beyond electoral fraud. The next section also shows that even if the share of fraudulent polling stations is correctly estimated, an attempt to convert it into the number or share of fraudulent votes stumbles upon several insurmountable obstacles.

Figure 3.1. Distributions of the last digit in the Russian presidential election of 2012 compared with Benford's law



Note: Second digit is used as the last digit for fractions since percentages are rounded (for example, Putin V_i^I/V_i = 616/1010 = 0.6099009901 -> 61%). The last digit for raw votes is empirically observed digit; theoretical distribution is fixed at the third digit since the average last digit equals 3.26 and 2.94 for valid votes and Putin's votes, respectively.

Another problem with the applicability of Benford's law to elections may be associated with the fact that scholars conventionally apply the test to distributions of the raw numbers of votes (vote counts) but not vote shares (percentages of votes)[52]. Figure 3.1 shows that this difference can be of crucial importance. Visibly, the last-digit distributions of valid votes and Putin's votes are much more congruent with Benford's law theoretical expectations than the corresponding distributions of turnout and Putin's vote share in the presidential election of 2012.

This result may seem counterintuitive but it becomes plausible if we consider the logic of fraud. The deviation of vote counts from Benford's law probabilities is more likely to occur if members of electoral commissions do not have clear indications regarding the level of fraud but are rather guided by an abstract rule: "the more the better but not too much". The deviation of percentages is more likely to appear if members of electoral commissions are instructed by their superiors that "the result of candidate A should be approximately ... percent of the vote".[53] In other words, percentage points are a more universal indication for fraudsters by their superiors than variable by the number of eligible voters and turnout vote counts. Meanwhile, percentages are interdependent with raw votes and there is a question how do falsifiers manage to distort (in terms of Benford's law) vote shares without impacting vote counts? One answer to this question is that falsifiers are aware that a multitude of zeroes and fives looks suspicious and therefore, as suggested by Medzihorsky (2015: 508), they may use simple tools such as dice or random number generators for producing vote counts. According to the second explanation, as was witnessed by the author in the role of electoral observer, fraudsters can falsify only the first or first two digits in vote counts leaving the last digit unamended (Appendix C3 shows that this type of fraud occurs in nearly one third of cases where a discrepancy between the official results and the corresponding vote counts from copies of polling station protocols is detected in the 2011 State Duma election). The third answer is more trivial. Since precincts vary by the number of eligible voters, the same percent of the vote translates into various vote counts. Given that the number of eligible voters obtained from the real world satisfies Benford's law, its derivatives should be also in conformity with Benford's law theoretical expectations. Therefore, if fraudsters manipulate with percentages of the vote in the first place and subsequently convert percentages into vote counts, the

[52] Fraction-based methods described in the next subsection are designed to explore the deviations in vote proportions. However, this group of literature is primarily focused on the distribution of only two digits (zeroes and fives) rather than applying Benford's law to the distribution of all digits in vote proportions.

[53] See the rewriting of protocols "in a line" and "in a dot" described in Chapter 2 as specific cases of such electoral forgery.

latter will match Benford's law expectations even if digit frequencies in percentages of the vote are generated not at random.[54]

Table 3.3. Probabilities of the last digit in the four Russian elections compared with Benford's law

Raw votes:		Valid votes				Putin/Medvedev/United Russia's votes			
Digit	3BL prob.	2012	2011	2008	2007	2012	2011	2008	2007
0	.10178	**.1054**	**.1053**	**.1089**	**.1043**	.1018	.1019	**.1038**	**.1031**
1	.10138	.1001	.1008	.1013	.0992	.1011	.1012	.0993	.0985
2	.10097	.1006	.0981	.0987	.1008	.0999	.101	.0997	.0973
3	.10057	.1006	.0998	.0988	.0983	.0983	.098	.0993	.1009
4	.10018	.0976	.0981	.0992	.0997	.1011	.1007	.0973	.0996
5	.09979	.1012	.0995	.103	.1	.1008	.0999	.102	.1025
6	.0994	.0987	.0986	*.097*	.0996	.099	.1005	.1003	.0999
7	.09902	.0981	.0994	.0995	.0985	.0981	.0999	.1013	.0986
8	.09864	.0988	.1005	.0973	.1003	.0998	.0989	.0995	.0987
9	.09827	.0989	.1	***.0963***	.0993	.1	.0981	.0976	.101
χ^2_{3BL}		23.58*	31.17**	78.7***	19.57	13.13	8.560	31.1**	37.43***
χ^2_{LBL}		42.79***	36.87***	117.7***	42.45***	13.16	14.85	32.86**	29.48**
Percentages:		Turnout				Putin/Medvedev/United Russia V_i^I/V_i			
Digit	2BL prob.	2012	2011	2008	2007	2012	2011	2008	2007
0	.11968	**.1209**	**.1214**	**.1352**	**.1278**	**.1067**	**.105**	.1026	**.1066**
1	.11389	***.0918***	***.0942***	***.0908***	***.0958***	.0981	.0986	.0996	.0977
2	.10882	***.0946***	***.0932***	***.0913***	***.0969***	.0979	.0973	.0975	.0975
3	.10433	***.0962***	***.0941***	***.0919***	***.0917***	.0972	.0982	***.0968***	.097
4	.10031	***.0941***	***.0939***	***.0935***	***.0921***	.0975	***.0964***	***.0951***	***.0957***
5	.09668	.0995	.0972	.098	***.0947***	.1025	**.104**	.1014	.0996
6	.09337	***.0966***	***.0963***	***.0933***	***.0938***	.1009	.1011	.1024	.1007
7	.09035	.0978	.0982	***.0955***	***.0969***	.0998	.0987	.0996	.0986
8	.08757	**.1033**	.1017	.1019	.0996	.1012	.0993	**.103**	.1018
9	.085	**.1053**	**.1098**	**.1087**	**.1107**	.0982	.1014	.102	**.1048**
$\chi^2_{2BL\%}$		1493***	1650***	2002***	1623***	1082***	1168***	1389***	1343***
$\chi^2_{LBL\%}$		606.2***	696.9***	1573***	1066***	74.8***	68.2***	64.9***	105.9***

Note: Probabilities Z-values of which exceed 3.26 (that equals to p = 0.01 since the level of significance is reduced with each of the nine comparisons) are shown in bold. Simple bold indicates a flow toward the digit, bold combined with italics indicates an outflow from the digit. Z-scores for each individual probabilities are calculated by the formula:

[54] The third explanation is seemingly the most relevant in accounting for the fact that last-digit distributions of vote counts are in conformity with Benford's law even in the most notorious regional cases of electoral malpractices in Russia (Chechnya, Ingushetia, Tatarstan, Bashkortostan, and others), while last-digit distributions of percentages of the vote indicate excessive fraud in these cases. See Appendix C2 for details.

$Z_k = \frac{p(k) - b(k)}{\sqrt{\frac{(b(k))(1-b(k))}{N}}}$, where *p(k)* and *b(k)* are respectively the observed and the Benford's law probabilities of digit k, and N is the number of observations; the Benford's law probabilities are of the last digit for the test (i.e., all digits' p = 0.1). The overall chi-squared statistic calculated by the formula $\chi^2 = N \sum_{k=1}^{9} \frac{(p(k)-b(k))^2}{b(k)}$ is reported for the second (2BL), the third (3BL), and the last digit (LBL, all digits' p = 0.1). Significant at: *p < 0.01, **p < 0.001, ***p < 0.0001.

In a more detailed way, Table 3.3 reports probabilities of the last-digit distributions for the Russian national elections of 2007–2012. In each of the four elections, last digits of the raw votes (vote counts) are distributed much closer to Benford's law probabilities compared with percentages[55]. Since Figure 3.1 shows not only a discrepancy but also an inconsistency between the observed values and the Benford's law probabilities (the observed values do not decrease gradually in the bottom plots), Table 3.3 reports chi-squared statistic for the last digit (LBL) additionally to the second (2BL) and the third digit (3BL). The distributions of the last digit of raw votes for Putin and United Russia in elections of the 2011–2012 electoral cycle pass both (3BL and LBL) tests. The distribution of valid votes of 2007 passes only 3BL test, which generally appears to be more favorable to vote count distributions than the LBL. Nevertheless, all elections under consideration are affected by fraud to a small degree only, if we draw inferences from the raw votes. This also follows from few significant deviations of the individual probabilities from the LBL indicated by bold in the table. Only zeroes are observed systematically more often (the exceptions are election years of 2011 and 2012), zeroes exceed the level of 0.1 by 0.043 on average between all distributions of vote counts.

By contrast, last digit's distributions of percentages are much more biased that is indicated both by chi-squared statistics and by the quantity of significant deviations of the individual probabilities from the LBL. Although percentages in my coding consist of only two digits, $\chi^2_{LBL\%}$ is almost three times smaller on average

[55] This discrepancy, in particular, may account for a weak association between the indicator of last-digit fraud in turnout counts (valid votes) and the election monitoring organization Golos's reports of election-day misconduct revealed by Skovoroda and Lankina (2017). In their study of the Russian 2012 presidential election, the likelihood ratio statistic for last-digit zeroes in turnout counts (the main explanatory variable) adds only 1% to the variance of pre-election reports of misconduct explained by other variables (the difference between M4 and M5 in Table 6). The effect of the likelihood ratio statistic for last-digit numbers from 1 through 9 in turnout counts is insignificant in all models. Although citizen's reports on electoral malpractices not necessarily account for the exact extent of electoral fraud, the effect of electoral fraud measured via the last-digit frequencies on the election-day reports of fraud should be stronger. This is implicitly confirmed in Appendix C2, which shows that chi-squared statistics for the last-digit frequencies of Putin's 2012 vote counts are significant at 0.05 level in only 5 regions, while chi-squared statistics for the vote percentages are significant in 26 regions at 0.05 level.

(532.0) than $\chi^2_{2BL\%}$ (1468.8). These numbers, however, exceed the average chi-squared statistics of the raw vote distribution tests manyfold (χ^2_{LBL} = 41.3 and χ^2_{2BL} = 30.4). This is strong evidence that scholars should focus more on application of digit tests to percentages rather than to raw vote counts. If differentiate between turnout (valid votes) and incumbent's vote share (incumbent's votes), it appears that turnout (valid votes) is unexpectedly more biased. This result cannot be explained during the exploratory analysis and requires further research. In any case, zeroes in the distributions of turnout prevail (having the average probability of .1266) over ones (.0932 on average), twos (.094 on average), threes (.0935 on average), and fours (.0934 on average). Nines also occur more frequently (1086 on average). Contrary to Rundlett and Svolik (2016) and Rozenas (2017) who assert the presence of many multiples of five (i.e., not only 65, 75, 85... but also 60, 70, 80... percent) in Russian electoral data, we do not find a confirmation of the prevalence of fives in Table 3.3. The deviations of the observed probabilities of five from the LBL are either insignificant or differently directed (in 2007 and 2011). However, not fives but zeroes in the last digit of vote share distributions are in fact observed more frequently than it should be under the uniformity hypothesis in election years 2007, 2011, and 2012. Zeroes are also overabundant in turnout distributions throughout all years.

In the aggregate, digit-based methods rather than estimating the precise amount of electoral fraud in percentage points, allow only to detect fraud in binary terms, i.e., to define whether or not electoral data are affected by fraud at a conventional level of statistical significance. Since types of fraud may vary, the extent to which statistics obtained from digit tests correlate with the amount of fraud in percentages is questionable. First objection is that members of electoral commissions, being aware that rounding of falsified votes or vote shares to ten or five is suspicious, may refrain from using these coarse numbers. Second, human biases in number generating process were revealed in experiments when subjects were asked to produce large-N sets of digits (see Beber and Scacco (2012: 218–220) for literature overview). These biases can be directly attributed to fraudsters at the national, state or county levels who deal with a large number of precincts. However, the extent to which these biases can be intrinsic to thousands of members of electoral commissions who are supposed to manipulate with vote counts at the lowest level in their own precincts only is uncertain. Third, all fraudulent practices occurring before the vote count – vote buying, voter intimidation and ballot stuffing – have almost no chance for reaching any predefined number or percent, whether it be a round number or not. These fraudulent techniques rather add some random quantity of fictitious votes to existing votes without distorting frequencies of digits, thereby making Benford's law tests irrelevant. For the sake of justice, it should be mentioned that digit-based methods rely on univariate analysis of vote counts and consequently require no assumptions regarding auxiliary variables, such as quality of turnout data (for example, Beber and Scacco (2012: 225) note that 30–40% of eligible voters were prevented from registering in Nigeria prior to the 2003 elections) or districting of lower-level jurisdictions in order to guarantee data homogeneity. Digit-based methods can be used in a complex analysis of electoral fraud or as an auxiliary tool to another more reliable method of electoral forensics. In particular, the analysis of electoral fraud in the Russian presidential elections of 2000–2012 in Chapter 4 utilizes chi-squared statistic for the deviation of the last-digit frequencies in the incumbent's vote share from Benford's law ($\chi^2_{\text{LBL\%}}$) along with other measures of fraud to create an adjustment for the estimate of the initial (i.e., not affected by fraud) incumbent's vote share.

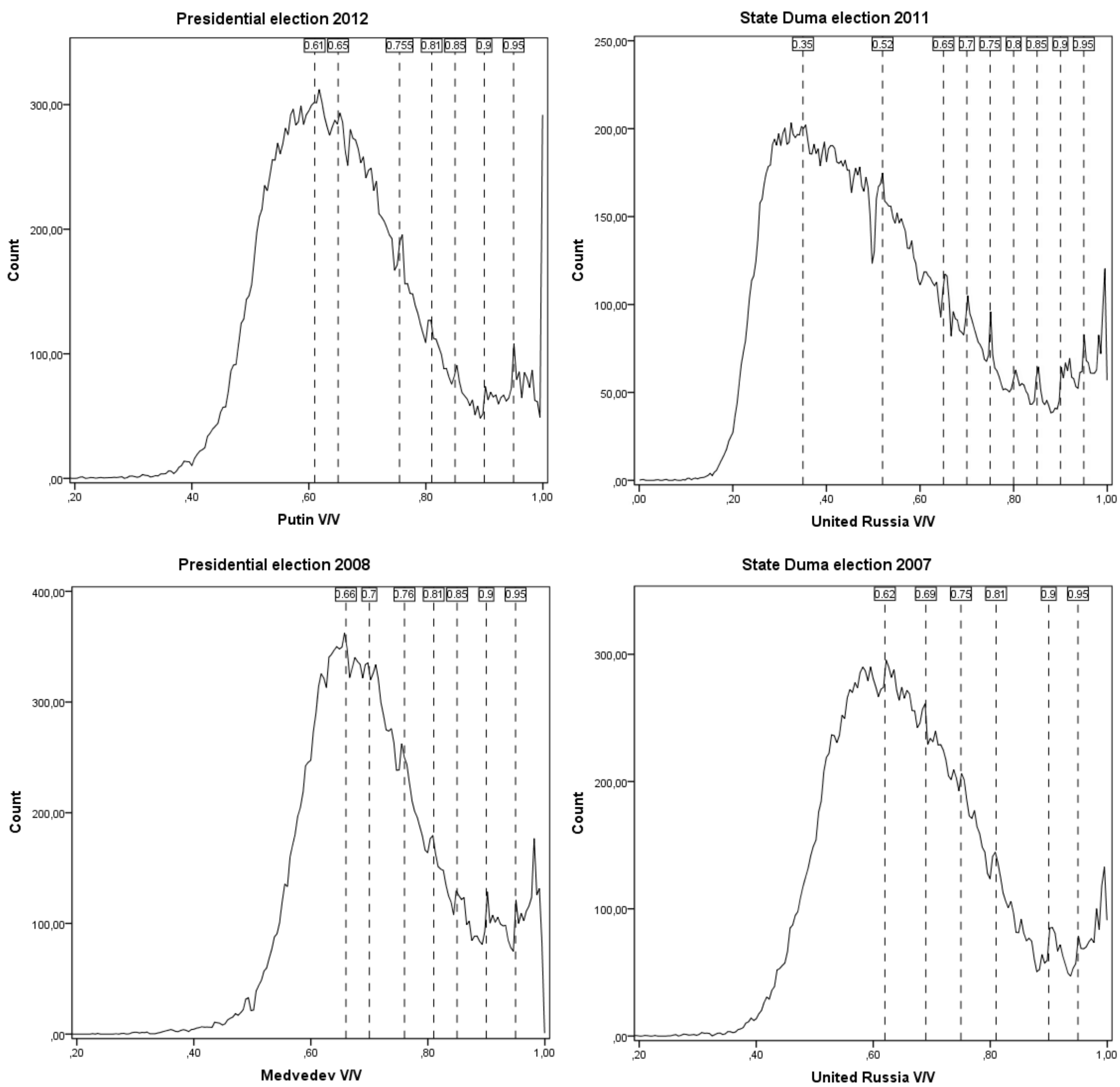
Fraction-Based Methods

Although scholars do not attempt to analyze the distribution of digits in vote shares with respect to Benford's law, observers noticed that spikes at round numbers (i.e., 0.5, 0.55, 0.6, 0.65 etc.) are overwhelming in distributions of vote shares if electoral quality is under question. Therefore, fraction-based methods aimed to gauge the irregular quantity of round numbers in vote shares can be alternatively called an "analysis of spikes". Besides detecting by the last digit probabilities of a vote share, the prevalence of round numbers can be easily depicted on linear plots. Figure 3.2 shows the phenomenon called "Churov's saw" in honor of Vladimir Churov, the chairman of the Central Electoral Commission of the Russian Federation from 27 March 2007 to 27 March 2016.[56] While the left tail of all distributions of incumbent's vote shares in the Russian presidential and parliamentary elections in 2007–2012 resembles the normal distribution, the right-hand side of distributions is littered with spikes at round numbers especially for vote shares higher than 0.75. On the each graph, the sharpest peak is located in the range within 97–100% of

[56] The idea and the title have been borrowed from user "nik_vik" at: http://podmoskovnik.livejournal.com/143958.html?thread=1127254#t1127254. Formerly the coincidence of local maximums with round numbers was mentioned by Buzin and Lubarev (2008: 197). Unusually sharp peaks at round numbers in distributions of United Russia's (2011) and Putin's (2012) votes have also pointed out by Kobak, Shpilkin and Pshenichnikov (2012: 2). Turnout distributions follow the similar pattern as vote shares but spikes not so regularly appear at round numbers. Due to space limits turnout distributions are not shown.

votes. The effect, however, is rather feeble. This is visible in the top right graph where the central point of United Russia's distribution, which follows after the unbiased left tail, is located at about 0.35 (recall that electoral observers also reported slightly over 30 percent of the vote), while the official vote share is reported to be 0.49. The distorted tail is characterized by spikes, which look even more aggressively than saw teeth. Kobak et al. (2012: 2) estimated that these unusual peaks account for approximately 1.4 million ballots for United Russia (in 2011) and 1.3 million ballots for Putin (in 2012). This is, of course, a sizeable number of votes but vote shares adjusted for these anomalous votes become smaller by no more than one percent leaving this estimate far from the actual amount of fraud.

Figure 3.2. The "Churov's saw": Density distributions of incumbent's vote shares in four Russian elections



Note: The data are binned at 0.001 and summed for each bin. Lines represent locally weighted (for each ten bins) non-parametric regression (LOESS). Count denotes the number of polling stations in one bin.

In a similar vein, Rundlett and Svolik (2016) used a difference between the actual distribution of Putin's vote share in the election of 2012 and its kernel density estimate (as a smoothed line that summarizes the distribution) to obtain a measure of "ruggedness" of the distribution. They then regressed this measure of ruggedness on Putin's vote share and, having found a positive relationship, concluded that local agents tend to oversupply fraud when the genuine popularity of the incumbent is high, and vice versa. Although the measure of ruggedness is generally an appropriate tool for detecting the uncommon spikes[57], the authors made a crucial mistake on the other side of the equation, namely, they gave the official incumbent's vote the status of genuine electoral support (i.e., they regressed their measure of fraud on electoral fraud plus true vote, which is treated as an error in this case). However, the official incumbent's vote is largely a product of electoral fraud. Looking ahead, my measure of electoral fraud developed in Chapter 4 (the percentage of fraudulent votes by region) has 75.9% of common variance with the official Putin's vote share in 2012. Meanwhile, Putin's sincere vote (the official vote subtracted by fraud) has little in common with electoral fraud (R-squared = 10.1%) and this result appears primarily due to outliers (the regions with extreme fraud). Once the variable of electoral fraud is ranked, the correlation almost disappears (R-squared = 2.8%). In the elections of 2000–2008, this relationship is also negligible: R-squared = 4.9%, 7.2%, and 0.0%, respectively. Contrary to Rundlett and Svolik's theory, this indicates that fraud does not increase with level of the incumbent's genuine vote[58].

Building upon the method proposed by Rundlett and Svolik, Rozenas (2017) points out that highly suspicious spikes in vote share distributions not necessarily result from fraud, they can be naturally determined by a small precinct size also. Based on the distribution of precinct-level vote shares of United Russia, the author demonstrates that spikes occur not only at multiples of five (e.g., 0.5, 0.55) but also at specific fractions with low denominator (such as 1/3, 2/5, 1/2, 3/5, and 2/3), which he calls "low-order fractions". The low-order fractions are more common in small precincts. For example, if an electorate consists of nine voters, the vote share

[57] The question is, however, appears regarding heterogeneity of the data. The analysis is performed at the aggregate level. The region-level distributions may be much more rugged (see Figure 3.4, for example).

[58] The presence of correlation would rather indicate that the measure of fraud is not independent from the official vote, which also consists of fraud in a large proportion, and therefore is not reliable.

1/2 can occur when turnout is equal to 2, 4, 6, and 8, whereas higher-order fractions are less probable and several of them (such as 568/931) can occur only when precinct size is sufficiently large.

To control for the likelihood of low-order vote shares, Rozenas offered a resampled kernel density (RKD) method and applied it to United Russia's (2003–2011), Putin's (2012), Canadian Conservative Party's (2011) vote shares, and to several simulated datasets. While the RKD estimates indicated no fraud in the Canadian case and correctly gauged the amount of fraud in the simulated data[59], fraudulent results were detected merely in 0.97% of polling stations (as maximum in the election of 2012). If we assume that the number of eligible voters and other characteristics do not considerably deviate from the election's average values and take the median number of Putin's votes in a polling station (417), we can calculate that the size of fraud in 0.97% out of 95,415 polling stations amounts to 385.9 thousand votes out of 45.6 million of Putin's officially reported votes and that this proportion of fraudulent votes accounts for a decrease in Putin's official vote share by 0.2% (63.6% – ((45,602.1 – 385.9) / (71,701.7 – 385.9))).[60] This number is much smaller than 1.3 million estimated by Kobak et al. (2012: 2) in their analysis of spikes. Furthermore, these calculations are based on the premise that all votes in the suspicious polling stations are forged. A more realistic assumption is that some quantity of voters actually voted at those polling stations that reported round numbers in their vote count protocols. This number of actual voters varies from region to region as well as the probability of reporting round numbers is not constant but tend to coincide with other types of fraud, and therefore be higher in regions with excessive fraud where the genuine outcome of voters' choices is undefinable. Uncertainty regarding this parameter results in rough overestimation of the number of fictitious votes drawn from analysis of spikes or from digit tests. I will not dwell on technical details of Rozenas's method. Even if we suppose that it correctly filters naturally originated spikes, analysis of spikes generally exhibits a small potential for detecting electoral fraud since it detects only a specific outcome of electoral forgery – spikes at round vote shares – and has similar drawbacks to digit-based methods.

[59] Rozenas, however, does not offer the reader to compare the RKD estimates with non-adjusted by probabilities of low-order fractions ordinary kernel density estimates offered by Rundlett and Svolik (2016), which should presumably exaggerate the amount of fraud in the simulated data.

[60] This calculation is positively biased since it uses the median number of officially reported Putin's votes in a polling station. However, the median number of true Putin's votes is unknown. Moreover, not exactly the median number of true Putin's votes is necessary for a precise calculation but rather the median number of officially reported Putin's votes subtracted by the number of fraudulent votes resulted from all types of fraud but those that have determined the "spikes".

Distribution-Based Methods

Apparently one of the most useful methods of electoral fraud detection has been offered by Sobyanin and Sukhovolsky (1993). The authors assumed that in the case of fair election turnout and vote share received by any candidate are uncorrelated. In a more concise manner it has been stated by Lukinova et al. (2011: 606):

> "Briefly, if we estimate the regression V/E = α + βT, where T denotes turnout, V is the number of votes officially recorded for a candidate and E is the number of eligible (registered) voters, then in a free and fair contest where, once again, the data are homogeneous, in that there are no unobserved variables intervening between T and a candidate's strength of support, β should approximately equal the candidate's share of the vote and α should equal 0.0".

It should be noted that V_i^I/E_i substantively differs from V_i^I/V_i. The latter is the relative (ordinary, reported everywhere) vote share calculated as the ratio of a candidate's raw votes to the number of valid ballots. The absolute vote share (V_i^I/E_i) is the ratio of a candidate's votes to the number of eligible voters. V_i^I/E_i should be preferred to make the test more sensitive to ballot stuffing. Since each stuffed ballot raises turnout (the number of candidate's votes and the number of valid ballots increase simultaneously), V_i^I/V_i becomes less reliable.

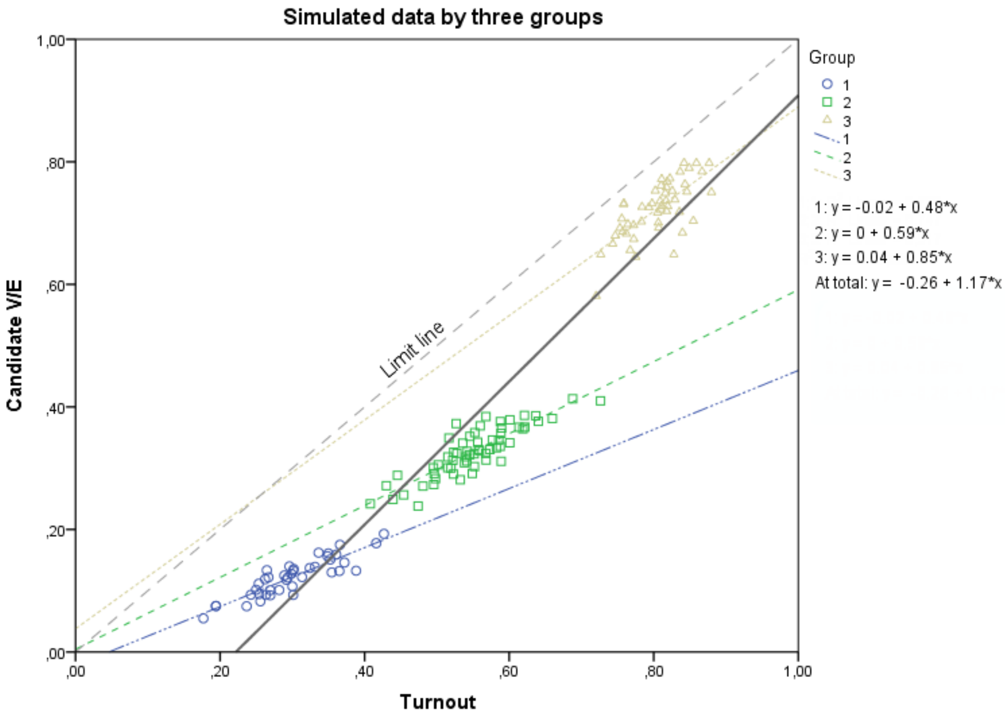
It also follows that since ballots are usually stuffed in favor of one candidate and each stuffed ballot adds +1 to turnout, the function of ballot stuffing is $V_i^I/E_i = \alpha + 1T_i$, more precisely, the fit line for ballot stuffing is parallel to $V_i^I/E_i = 0 + 1T_i$ (see Figure 2.2 for illustration). Beta-coefficients may even exceed 1 if votes of one or several candidates are illegally transferred in favor of another candidate. Both statements are valid if the number of observations exposed to fraud is sufficiently large to tilt the regression line up to the defined values.

This method has been repeatedly applied later, including elections in Russia (Buzin and Lubarev (2008); Myagkov, Ordeshook and Shakin 2005, 2009; Shpilkin 2011; Lukinova, Maygkov and Ordeshook 2011), and has been subject to several theoretical critiques.

Data Homogeneity

First of all, an important precondition of the correct performance of the method is the internal homogeneity of data, i.e., there should be no independent groups inside the overall array having their own values α and β. The vulnerability of ordinary linear estimates to data heterogeneity is displayed in Figure 3.3. The simulated data presents three different groups of cases not subjected to fraud and having different turnout and vote shares received by hypothetical candidates. The distribution in general creates an illusion of fraud: the Y-interception point of the fit line at total is far below 0 and β exceeds 1, although each group's α is close to zero and β approximately equals the candidate's vote share.

Figure 3.3. The ecological inference problem: Vulnerability of linear estimates to data heterogeneity



Inclusion of the internally heterogeneous data in the analysis was the main reason for criticism of Sobyanin and Sukhovolsky's method by Myagkov, Ordeshook and Shakin (2009: 32–42). The problem of data heterogeneity may be solved in two ways. One of the solutions implies using a multilevel model allowing α and β to vary by region or by census variables (Levin, Cohn, Ordeshook and Alvarez 2009). Myagkov, Ordeshook and Shakin (2009) used a semi-parametric model estimating coefficients within similar regions and then constructing a weighted average.

Chapter 4 develops a similar approach. Firstly, the electoral data of precinct electoral commissions (UIKs) are analyzed separately for each territorial electoral commission (TIK) – the first level of aggregation. Then, coefficients are weighted by population and nationally averaged to obtain the overall result. Performing the analysis by TIKs (the first level of aggregation) instead of regions (the second level of aggregation) allows to reduce the likelihood of heterogeneity. Since the average number of UIKs in a TIK is about 50 in the federal Russian elections – a TIK usually encompasses a set of villages within an administrative district (*raion*), a small city or a big city's ward – the difference in demographic characteristics and levels of political support should be minimal.

Turnout and Candidate Votes are Assumed to Be Independent

A second critique questions the assumption that turnout and candidates' votes are independent of each other. This assumption may be violated if intervening variables simultaneously affects turnout and vote share for one of candidates. For instance, Hansford and Gomez (2010: 270) point out that while U.S. voters tend to be better educated, wealthier, and older than non-voters, the same social factors have also been fairly stable predictors of support for the Republican Party and its candidates. DeNardo (1980: 409) also note: "[d]emocratic identifiers are thought to be poorer, less educated, more "ethnic," and more urban than their Republican opposite numbers, and therefore the more "marginal" or "peripheral" voters." Consequently, the Democrats should receive more votes when more peripheral voters (i.e., those who vote occasionally) come to the polls.

However, an increase in turnout may affect vote choice in different ways. Studying U.S. congressional voting in the period from the late 1930s through the middle 1960s, DeNardo (1980) revealed that signs of the slopes tend to be positive where the Republicans were a majority and negative where the Democrats dominated. Trying to explain this finding, DeNardo presumed that rates of defection are higher among peripheral voters, in contrast to core voters whose party preferences are more stable. It follows therefrom that only the minority party (either the Democrats or the Republicans) should benefit from high turnout. This proposition has been tasted later based on the U.S. congressional county-level data from 1948 through 2000 by Hansford and Gomez (2010). Using election day rainfall as an instrumental variable for voter choice to account for possible endogeneity between turnout and electoral choice, they found a positive effect of turnout on the Democratic vote but only in Republican counties. Nevertheless, the two-effect theory of DeNardo was not confirmed by Godbout (2013) who also employed an instrumental variable approach but used the mean statewide turnout rate outside a specific congressional district as an instrument instead of the level of rainfall. He supposed that the influence of turnout on the incumbent vote share is conditional on the presidential vote in the district. This supposition was confirmed, however, higher turnout in marginal Democratic districts (where the same party presidential support was low) did not appear to increase the Democratic vote share, and high turnout in strong Democratic districts was not favorable to the Republicans. DeNardo's hypothesis was also rejected by Martinez and Gill (2005) who used individual-level data of the 1960–2000 American National Election Studies to simulate electoral effects of turnout by adding or removing the respondents with the lowest or the highest probability of abstaining. By changing turnout in this wise, they found that the defection rate was nearly constant as the simulated turnout increased in the presidential elections of 1960–1976. The results of the following election years were more favorable to DeNardo's model but Martinez and Gill found no instance of Republicans being advantaged by high turnout when they were the minority party.[61]

Grofman, Owen and Collet (1999) put forward a third explanation of the effect of turnout on the vote. High turnout rate in hard times may indicate an intention of peripheral voters to unseat the incumbent at the polls. Hansford and Gomez (2010: 280) found a confirmation for this hypothesis: turnout exerts a positive effect on Democratic vote share for 95% of the observations in which there is a Republican incumbent and a pro-Republican effect in very Democratic counties when there is a Democratic incumbent. Hansford and Gomez (2010) also argue that high turnout makes electoral outcomes less predictable. Hence, the effect of turnout on the vote is not straightforward. Only the first explanation (if those who are more likely to vote share common social and demographic characteristics with incumbent voters) coincides with the positive relationship predicted by the electoral fraud theory. In several other cases the effect of high turnout can arguably be negative for the incumbent vote and therefore cannot be attributed to electoral fraud. For better understanding of the relationship between turnout and the vote, this subsection focuses on possible intervening variables that may influence both variables and examines their potential effects relatively to effects of electoral fraud.

In different national contexts, scholars have demonstrated that turnout is influenced by such institutional variables as district magnitude, type of electoral system and type of elections – parliamentary or presidential (Jackman and Miller

[61] Martinez and Gill (2005: 1251) also underline the most essential weakness of DeNardo's argument: it assumes that both weak partisans defect at similar rates (for example, 50/50) but provides no theoretical ground for this assumption. Indeed, it is unclear why electoral preferences among peripheral voters should necessarily differ from voter preferences of core voters as such (i.e., if no other variables such as demographic characteristics play a role).

1995; Blais 2000). In our case, these variables are of little interest since they are constants rather than variables in the Russian context. The literature shows that there is no well-marked relationship between turnout and such socioeconomic variables as level of urbanization and economic development since the direction of relationship changes under the influence of other variables and in different national contexts (Dettrey and Schwindt-Bayer 2009; Fornos, Power and Garand 2004; Kuenzi, Lambright 2007).

The most important variables in our case, which can vary from one polling station to another, are age and education. It has been proven that both variables have a positive relationship with turnout (Blais 2000; Milligan, Moretti and Oreopoulos 2004; Wolfinger and Rosenstone 1980). Yet studies have shown that the proportion of pensioners and people with higher education can explain only a small share of the variance of turnout in Russia's regions (Moraski 2002; Reisinger and Moraski 2008). It is also considered that the anticipation of close electoral outcomes increases turnout (Franklin 2004). Nevertheless, in the case of national elections it should be assumed that the perception of vote decisiveness does not vary between polling stations since voters are likely to assess the candidates' chances of success throughout the country in general rather than at a particular polling station. To clarify the influence of the variables under consideration on turnout, I run five logistic regression models using survey data on the Russian presidential elections between 1996 and 2012.[62]

Table 3.4 shows that the explanatory variables have the theoretically predicted signs. Age appears to be the strongest predictor of turnout; it is significant in all election-year models. At the personal level, keeping all other variables at their means, the predicted probability of turnout (as of 2012) for a young person (20 years) is by 21.9% smaller than for an old person (70 years): 64.8% versus 86.7%, respectively. The variable of education follows second. Its significance decreases over time. The effect reached its maximum in 1996 when the predicted probability of turnout for the most educated respondents was by 11.0% larger than for the less

[62] The analysis employs the data of the Courier – a series of repeated surveys on general social issues carried out beginning from 1992 onwards. The survey of 1996 (Courier 1996-18) was carried out by the Russian Public Opinion Research Center (VCIOM) in the period between the first and second round of the presidential election (25.06.1996 – 27.06.1996). The fieldwork of all other surveys took place soon after the presidential elections of 2000, 2004, 2008, and 2012 were held. Courier 2000-14 was done by VCIOM (31.03.2000 – 03.04.2000). All subsequent surveys were performed by the Levada-Center: Courier 2004-5 (18.03.2004 – 23.03.2004), Courier 2008-4 (14.03.2008 – 18.03.2008), and Courier 2012-5 (16.03.2012 – 19.03.2012). The data were kindly provided by the Joint Economic and Social Data Archive (available at: http://sophist.hse.ru/db/oprosy.shtml?ts=6&en=0).

educated ones. Our main variables of interest (trust in incumbent candidates and trust in the major opponent Gennady Zyuganov)[63] do not show stable effects over time: the effect is positive for Zyuganov in 1996 and 2000 and positive for both Zyuganov and Putin in 2008 and 2012. This may hastily be interpreted as counterevidence against the assumption of Sobyanin and Sukhovolsky's method since stronger trust in a candidate leads to higher probability of turnout and, more likely, to actual voting for this candidate, too.

Table 3.4. Explanation of turnout in the five Russian presidential elections: Logistic regression models

DV: Turnout	1996	2000	2004	2008	2012
Constant	.263* (-2.21)	.365* (-2.15)	.047*** (-6.26)	.089*** (-4.28)	.268** (-2.83)
Gender (female)	-.0082 (-.46)	.0032 (.15)	-.0162 (-.77)	.0389 (1.68)	.0546* (2.09)
Age	.0039*** (5.53)	.0048*** (5.29)	.0118*** (11.97)	.0041*** (4.44)	.0044*** (3.93)
Education (higher)[b]	.0584*** (4.02)	.0331*** (3.65)	.0216*** (3.51)	.0143* (2.34)	.0122 (1.65)
Things in the Country Go in the Right Direction	.0494* (2.38)	.0429 (1.77)	.0383 (1.65)	.0584* (2.11)	.1031*** (3.51)
Personal Income (rubles)	2.3e-5 (.81)	8.6e-7 (.06)	-8.2e-6 (-1.48)	-5.2e-6* (-2.31)	-1.3e-6 (-.79)
Last-Year Change in Personal Material Conditions (better)	.0062 (.63)	n.a.[a]	n.a.[a]	.0423** (2.83)	-.003 (-.23)
Pensioner	-.0186 (-.73)	-.0315 (-.86)	-.0794 (-1.89)	-.0323 (-.76)	-.0157 (-.34)
Trust in Zyuganov	.1111*** (3.91)	.063* (2.04)	.099 (1.57)	.1843*** (3.88)	.1363** (3.11)
Trust in Yeltsin (1996) / Putin (2000–2012)[c]	.021 (.89)	.0309 (1.17)	.0151 (.6)	.1067*** (4.05)	.1091** (3.45)
Trust No One	-.1132*** (-5.0)	-.1325*** (-4.47)	-.0492 (-1.47)	.0041 (.1)	-.0493 (-1.33)
Rural Area[d]	n.a.[a]	n.a.[a]	-.0199 (-.85)	.0705* (2.48)	-.0563 (-1.93)
Number of obs.[e]	1197	1175	1098	1106	1091
Log likelihood	-417.61	-504.76	-446.15	-514.27	-557.15
Pseudo R-squared	.13	.098	.226	.093	.089

Note: Entries, except the constant that is odds ratio, are conditional marginal effects (CMEs) with z-values in parentheses. The CMEs can be roughly interpreted as β-coefficients in the OLS models, i.e., as a change in the dependent variable, which is the probability of

[63] Trust in a candidate is used as a proxy for his electoral support. The direct measure of the electoral choice would imply using multinomial logistic regression, yet it would make testing our alternative explanation of turnout as a product of diffuse support for elections problematic. Besides that, trust in a candidate partially helps to overcome the endogeneity problem so far as the relationship between the level of trust and turnout is of the less simultaneous nature than the relationship between candidate vote and turnout.

turnout, resulted from one-unit change in the predictor variable[64]. a. Indicates that the question had not been asked in the survey. b. The variable of education has 3 ranks in 1996, 6 ranks in 2000, and 8 ranks in 2004–2012. c. Even though Medvedev was formally the incumbent in 2008, I use trust in Putin to predict turnout in 2008 inasmuch as Medvedev's legitimacy is derived from Putin's legitimacy. Using trust in Medvedev does not substantively change the results. d. The variable of rural area is coded 1 if the responded lives in the village and 0 if residence is the city of any size. e. The number of observations is smaller than the average sample's size (1600) due to the filtered responses "do not know" and "no answer". Significant at: *p < 0.05, **p < 0.01, ***p < 0.001.

However, we should more correctly infer from the table that it rather confirms findings of the previous studies suggesting that turnout is an outcome of trust in electoral process (Birch 2010; Carreras and İrepoğlu 2013; Gerber et al. 2013; Simpser 2013: Ch. 7) or even of such broader phenomenon as general political trust, which includes trust in political institutions, trust in political actors, satisfaction with government, and satisfaction with democracy (Dalton 2004: Ch. 8; Grönlund and Setälä 2007; Wang 2016). To support this assertion, I include the variable of trust no one in the models.[65] It is strongly significant in election years 1996 and 2000 and accounts for a decrease in the probability of turnout by 11.3% and 13.3%, respectively. The absence of significance in the subsequent years, however, does not indicate the absence of the effect in these years. It should be understood that trust in politicians and trust no one are two competing and to a considerable extent mutually exclusive explanations. While the former is associated with both specific and diffuse political support, the latter refers only to diffuse support for elections (Easton 1975). Namely, those respondents who trust in one of the major candidates, besides this specific political support, tend also to trust in elections as a political institution inasmuch as their most-trusted candidates participate in electoral contest. Those who trust no one have more incentives to distrust the entire electoral process so far as they do not see any candidate who

[64] I tried running analogous multilevel logistic regression models with coefficients varying by region. The results appeared to be pretty similar to those reported in the table (throughout all models, individual z-values did not deviate by more than 1.03 unit, the median absolute deviation of z-values between the models amounted to 0.16). Unfortunately, conditional marginal effects cannot be obtained from the multilevel model (the estimated coefficients and odds ratios are much less informative) and the multilevel model does not show a goodness of fit (pseudo R-squared). For these reasons, Table 3.4 presents the ordinary logistic regression models.

[65] The questionnaire contains a long list of the most relevant politicians for each year (from the minimum of 37 in 2000 to the maximum of 55 in 2008). The question asks to select five or six most-trusted politicians (therefore, a simultaneous selection of the incumbent and the competitor is possible, yet this proportion is small and varies from the minimum of 0.7% in 1996 to the maximum of 7.8% in 2000). At the end of the list, the respondent is offered an option "trust no one" or "there are no such [politicians]". The share of trusted no one was 13.6% in 1996, 17.0% in 2000, 13.5% in 2004, 9.1% in 2008, and 13.7% in 2012, i.e., it was the third major candidate throughout 1996–2012.

might represent them. Therefore, due to the lack of diffuse support for elections as a political institution, they less likely come to the polls. In other words, the skepticism toward elections prevailed in determining turnout in 1996 and 2000, then the pattern has changed and the positive motivation to political participation became more important. It should be noted that if these competing explanations were entered in the models independently, they would not mutually suppress each other and their explanatory power would rise.[66]

A similar conclusion can be made regarding the variable of general social satisfaction – a positive response to the statement that things in the country go in the right direction. The variable is strongly significant in 2012, weakly significant in 1996 and 2008, and insignificant in 2000 and 2004. This relatively small level of significance is again due to the fact that the variable measures a particular type of social support, and therefore it competes with the variables of political support. If the variables of trust in politicians and trust no one were excluded, the level of significance of the general social satisfaction would accordingly increase.[67] Since the general social satisfaction is a product of all policies in the county, this fact also confirms the assertion that turnout is an outcome of various types of political support.

Other variables in the models do not reach a sufficient level of statistical significance. The probability of turnout for women is by 5.5% larger, yet this estimate is significant only in 2012. Contrary to Reisinger and Moraski (2008), who relied on statistical cross-regional data, our models do not find confirmation for the proposition that pensioners more likely participate in elections. Once the variable of age is controlled for, we do not need to know whether the respondent is pensioner or not to predict the propensity to vote. The level of personal income and the last-year change in personal welfare do generally not impact the probability of turnout. Perhaps the most unexpected finding is that urbanization demonstrates no consistent effect on turnout. It is a well-known fact that officially reported electoral data show higher levels of turnout in the rural area, even in the 1990s (Moraski 2002) when electoral fraud was not so widespread.[68] Nevertheless, respondents who

[66] I ran analogous logistic models as in Table 5 but without the variables of trust in Yeltsin / Putin and Zyuganov. The effect of trust no one was always significant and negative with the smallest z-value = 2.09 and the average z-value = 4.34. If the variable of trust no one is excluded from the models, the effects of trust in Yeltsin / Putin and Zyuganov are enhanced: they become significant, except the election year 2004; the average Zyuganov z-value increases to 3.6 and the average Yeltsin / Putin z-value increases to 3.11.

[67] The average z-value between 1996 and 2012 would be equal 3.14 in this case.

[68] It is common wisdom that incumbent vote shares and turnout rates are also higher in the regions with republican status, i.e., in predominantly non-Russian regions. Unfortunately, out of our five surveys, only the

lived in the rural area more probably participated only in the election of 2008, their predicted probability is by 7.1% larger compared with those who lived in the city; the effects of 2004 and 2012 are negative and insignificant.

Joining all findings together, we may conclude that 1) the positive relationship between trust in a candidate (as opposed to trust no one) and turnout reflects diffuse support for elections as a political institution; and 2) even if the relationship between trust in a candidate and turnout exists, it is positive for *both* incumbent and opposition candidates, it is not negative for opposition candidates as in most cases of electoral fraud (Lukinova, Maygkov and Ordeshook 2011; Myagkov, Ordeshook and Shakin 2009: Ch. 3). Furthermore, the explanatory power of the models is small (the average R-squared = 12.7%) and the effects described above exist at the personal level. If we are realists, we should admit that no two regions, territories or polling stations exist where the *average* age, as well as any other variable, ranges within the same minimal and maximal values as in the national surveys (i.e., from 18 to > 70, as age ranges). The differences between regions or polling stations are much more moderate than the ranges at the personal level. Therefore, according to the results from Table 3.4, we cannot expect to empirically observe that a 20-percent increase in trust in the incumbent would translate into nearly the same increase in turnout as follows from Figure 2.4, for example.[69]

The prior analysis examined the possible explanations of turnout, including trust in candidates as a proxy for their electoral support. The second question is to what extent potentially intervening variables can account for incumbent's vote.[70] To answer this question, Table 3.5 presents the vote for the incumbent being explained by the same set predictors as in Table 3.4, excluding the variables of trust. It

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survey of 2000 asks the respondents about their ethnicity (whether they are Russians, members of indigenous nationality of the republic, half-Russians or of other ethnic origin). I included the variable of ethnicity in the model (as in Table 3.4) as a factor with Russians specified as the reference category. None of other ethnic groups appeared to be significantly different relatively to Russians with regard to their probability of turnout. This result persisted in various model specifications. For the reasons of parsimony and because the variable of ethnicity is not available for other election years, I do not use it in the main analysis.

[69] Consider the most influential variable – age. Keeping all other variables at their means, shifting the median regional age in the sample of 2012 from its minimum of 39 (Stavropol Krai and Altai Krai) to the maximum of 51 (Lipetskaya Oblast and Kostromskaya Oblast) translates into an increase in the predicted probability of turnout from 74.8 to 80.1 percent. Alternatively, we may use the data of Rosstat (2013a) on the population composition. In this case, all else being equal, a shift from the 5th percentile (32.2 years, the level of Dagestan) to the 95th percentile (41.7 years, the level of Pskov Oblast) increases the probability of turnout from 71.5 to 76.1 percent. Although the demographical statistic is not available at lower levels, one may reasonably suppose that these effects are much smaller between municipalities and absent or infinitesimal between two adjacent polling stations.

[70] I use incumbent's vote as the dependent variable because the main question is about the independence of the vote share from turnout. However, if the variable of trust in incumbent is used instead, the results would be very much similar to those presented in the main text.

follows from the table that the probability to vote for the incumbent is primarily explained by a single variable of the general social satisfaction.[71] If respondents agree that things in the country go in the right direction, their propensity to vote for the incumbent increases by 43.0% on average between 1996 and 2012. It might have been a key intervening variable between turnout and incumbent's vote, yet its effect on turnout is much weaker and insignificant in 2000 and 2004 as indicated in Table 3.4.

Table 3.5. Explanation of incumbent's vote in the five Russian presidential elections: Logistic regression models

DV: Voted for the Incumbent	1996	2000	2004	2008	2012
Constant	.0649*** (-4.96)	.2428*** (-3.89)	.1507*** (-5.26)	.1439** (-2.94)	.0303*** (-7.37)
Gender (female)	.0527 (1.44)	.0429 (1.36)	.1219*** (3.98)	.1142*** (3.99)	.1382*** (3.8)
Age	-.0015 (-.99)	.0029* (2.09)	.0028** (2.18)	-.0019 (-1.61)	.0058*** (3.82)
Education (higher)	.0033 (.12)	-1.1e-5 (-.0)	.0048 (.58)	.0021 (.28)	.0022 (.21)
Things in the Country Go in the Right Direction	.5996*** (15.59)	.3851*** (11.88)	.3532*** (11.13)	.2676*** (8.73)	.5452*** (13.62)
Personal Income (rubles)	-1.2e-5 (-.36)	-5.1e-5* (-2.08)	-3.3e-8 (-.0)	4.5e-6 (1.16)	-5.5e-6* (-2.02)
Last-Year Change in Personal Material Conditions (better)	.0516* (2.45)	n.a.	n.a.	.0559** (3.13)	.0208 (1.09)
Pensioner	.0261 (.49)	-.0715 (-1.38)	-.0365 (-.78)	-.0045 (-.1)	-.0491 (-.83)
Rural Area	n.a.	n.a.	-.0311 (-.92)	.0558 (1.69)	.0614 (1.49)
Number of obs.	1132	1171	1210	.875	1026
Log likelihood	-494.5	-727.9	-749.4	-402.2	-575.8
Pseudo R-squared	.284	.099	.093	.164	.189

Note: Entries, except the constant that is odds ratio, are conditional marginal effects with z-values in parentheses. See notes to Table 3.4 for more details. Significant at: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

The effects of the other variables are generally incommensurable with those in Table 3.4. Women appear to vote for Putin and Medvedev by 11.4 to 13.8 percent more but this holds true only in 2004–2012. Age exerts a strong impact on incumbent's vote, commensurable with its effect on turnout in Table 3.4, but only in 2012; the effect is twice smaller in 2000 and 2004 and insignificant in 1996 and

[71] I tried to run the models without the variable of general social satisfaction. Significance of other variables slightly increased, without a change in the overall pattern, yet explanatory power of the models expressed as pseudo R-squared dropped to 3.4 percent on average between 1996 and 2012.

2008. The variables associated with personal welfare are rather sporadically significant. In contrast to Table 3.4, education does not determine vote for the incumbent in any year. The status of pensioner and urbanization are insignificant as well.

In the aggregate, the vote for incumbent is predicted by the same factors that determine turnout in a very limited extent only. Drawing inferences from Table 3.5 additionally to Table 3.4, we cannot again conclude that a 20-percent increase in any potentially intervening variable would translate into a similar increase in the incumbent's vote share as it may occur in the case of electoral fraud. In fact, no such effect was found even in the United States where the similarity of demographic profile between core voters and Republican voters is more evident.[72] Thus, the *simultaneous* impact of potentially intervening variables on turnout and incumbent's vote is much less influential than electoral fraud and, therefore, not essential for further research.

The Normality of Distribution

Third, the conventionally recognized assertion is that having not been exposed to fraud, turnout takes the shape of a normal distribution and ballot stuffing causes the distribution to become bimodal (Myagkov and Ordeshook 2008; Myagkov, Ordeshook and Shakin 2005, 2009; Lukinova, Maygkov and Ordeshook 2011). The distribution of turnout can indeed be bimodal if ballot stuffing takes place at several polling stations. Yet if ballots were stuffed at all or almost all polling stations irrespective of the type of stuffing – "directively" (approximately the same percent at all stations) or randomly – the turnout distribution may still remain normal. Moreover, as Figure 2.3 shows, falsification may affect only the vote share without impacting turnout thereby allowing it to remain normally shaped. The exception here may again be attributed to heterogeneity in the pooled data.

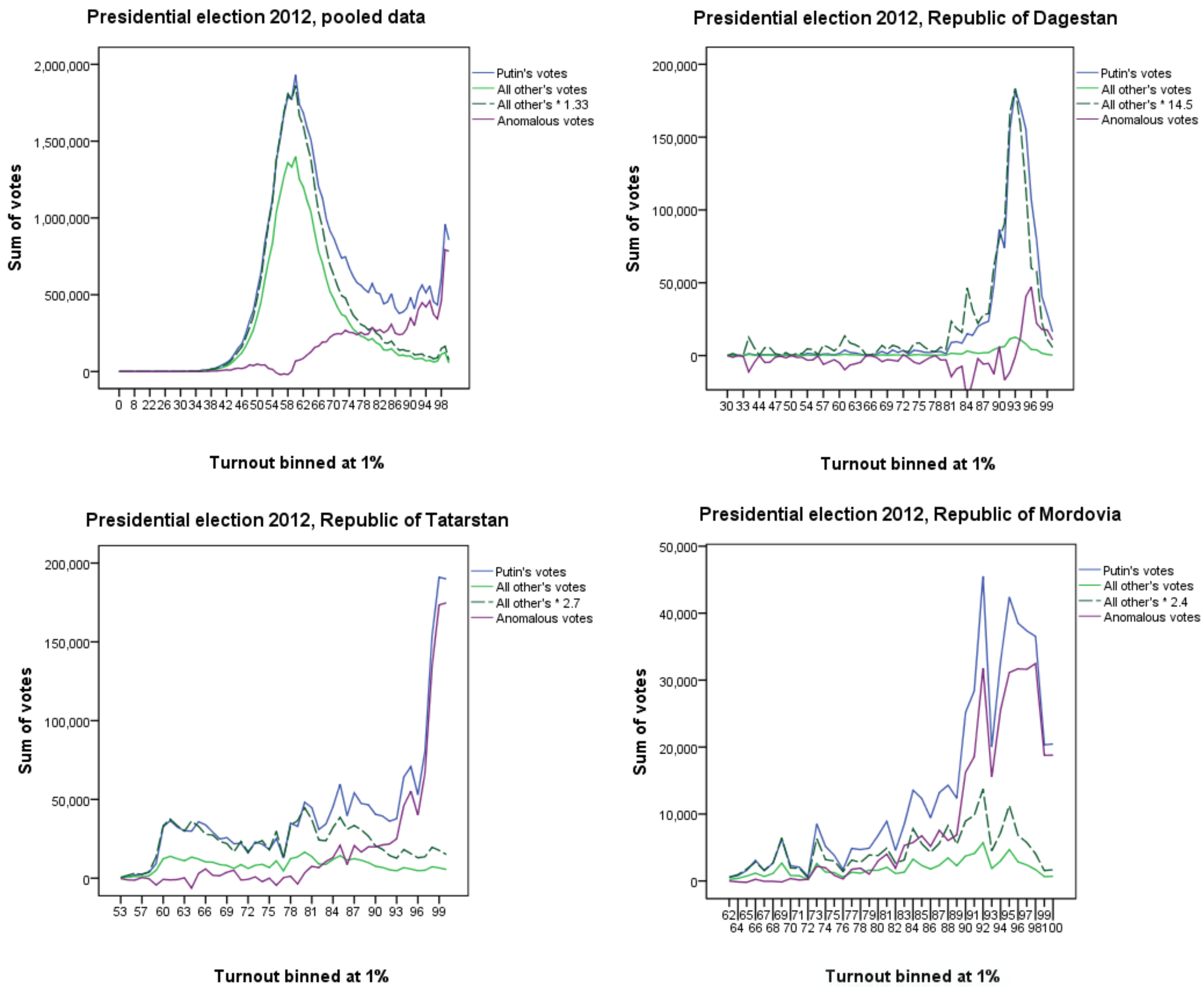
[72] Martinez and Gill (2005) estimated that a 40-percnt increase in turnout (from 51.2% to 91.2%) in the election of 1960 (when the relationship between turnout and the Democratic vote was the strongest) would have added 5.8% to Kennedy's vote. The estimated effect in the subsequent election years amounted to 5.3% in 1964, 3.6% in 1976, 3.7% in 1984, and 0.8% in 2000. Put otherwise, one unit change in turnout yields from 6.9 to 50 times smaller change in in the vote. Similarly, based on their simulation, Hansford and Gomez (2010: 284) inferred that "a 4% swing in turnout leads to an average change in Democratic vote share at the national level of just less than one percentage point." Following from Figure 4 in their article, a 40-percent increase in turnout (from 40% to 80%) raises the predicted Democratic vote share in an average county from about 40% to 50%, and this holds true in cases with a Republican incumbent. If there is a Democratic incumbent (Figure 5), the effect of a 40-percent increase in turnout is negative, the Democratic vote share decreases from about 54% to 50%.

Shpilkin (2011), examining the distribution of the sum of raw votes in one-percent turnout intervals in the elections of the 2007–2008 electoral cycle in Russia, found that votes for the incumbent candidates decreased at a slower rate on the right tail of the distribution and even continued to grow in the range near 100%, while votes of the opposition candidates were more consistent with normal distribution. Then he created an algorithm to cut off the anomalous tail of the incumbent's distribution of votes and calculated that the discrepancy between the official and predicted turnout in the Duma election was 13%, while the discrepancy of the United Russia votes was 8.42%; in the presidential election the turnout discrepancy was 13.77% and the discrepancy of votes for Medvedev was 7.32%.

As stated earlier, the assumption of internal data homogeneity is an important condition for the validity of such tests. In Shpilkin's analysis this requirement is not met. As a result, false relationships could be estimated as fraud. Figure 3.4 replicates Shpilkin's analysis for the presidential election of 2012. The number of anomalous votes for the pooled data is beginning to grow when turnout transcends 60%. The 12 million anomalous votes overall account for 7.2% of the official vote share of Putin. In the more recent paper, Shpilkin with colleagues implemented a more accurate calculation performed separately for urban and rural territories and for nine republics, which yields a much smaller amount – about 7 million (4 %) of anomalous votes for Putin (Kobak, Shpilkin and Pshenichnikov 2012: 4).

However, applying the method to region-level data gives rise to several difficulties. If the left tail of the distribution is normal-shaped then defining the first local maximum is a simple task but it can be undefinable for heavily distorted distributions. In Dagestan, for example, fitting votes of all other candidates to the highest peak of Putin's votes produces a negative estimate of anomalous votes that slightly increases the official vote share from 93.2 to 93.5 percent. Although distributions of votes in Tatarstan and Mordovia have nothing in common with normality, the left tails allow fitting the votes line for all the other candidates to the one of Putin. The official vote shares for Putin substantively stand out from the "corrected" vote shares: 83 versus 73 percent in Tatarstan and 88 versus 71 percent in Mordovia, respectively. What do not look trustworthy are the unusually small turnout rates – 51% in Tatarstan and 37% in Mordovia – estimated given the number of anomalous votes. The fallacy of the method is that it treats votes cast for opposition candidates as a benchmark. A common feature of blatantly falsified elections, however, is that opposition votes are counted for the incumbent or there may be no vote count at all but artificial numbers can be drawn in return sheets in a haphazard way instead.

Figure 3.4. Shpilkin's method in application to the pooled data and three Russia's regions



Note: All other's votes are the sum of votes cast for all candidates except Putin (equal to valid votes subtracted by Putin's votes). The multiplicative coefficients were defined after fitting lines of all other's votes with Putin's votes. Anomalous votes are the difference between Putin's votes and all other's votes multiplied by the coefficient.

Klimek, Yegorov, Hanel and Thurner (2012) proposed another distribution-based method for election irregularities detection that assumes normality of distribution. They estimated a measure of incremental fraud based on the difference between theoretically modeled and empirically observed analogues of the mean (the first local maximum) and a left(right)-sided standard deviation from the mean (σ_v^L, σ_v^R). As the authors show, standard measures of skewness and kurtosis for turnout and vote share are not distinguishable between fraud-alleged and fraud-free elections (both statistically deviate from normality), while the measures of incremental and extreme fraud strongly exceed zero for elections in Russia and Uganda.

Mebane, Egami, Klaver and Wall (2014) and Mebane (2016) found several statistical shortcomings in Klimek's method and modified it. Using different approaches to fitting models (based on chi-squared and finite mixture model estimated via EM algorithm), they found that the estimates of incremental fraud (f_i), extreme fraud (f_e), and the parameter a differ largely between these three types of fitting. For example, the estimated probability of incremental fraud in California for the 2008 presidential election from the original model is equal to 0.996 (i.e., almost all votes are falsified), the chi-squared model's estimate is equal to 0.88, and the finite mixture model's estimate indicates nearly no fraud (0.0006) (Mebane et al. 2014: Table 1). For the Russian 2011 parliamentary election (at the precinct level), the original estimate of f_i signalizes fraud with the probability of 0.998 (Klimek et al. (2012: 16472), however, estimated it at 0.64), chi-squared-based f_i = 0.238, and finite mixture-based f_i = 0.429. To demonstrate that the modified method outperforms the original version, the authors, in particular, predict the incidence of various post-electoral complaints in the 2009 German election by f_i, f_e, a, and the interaction between them. While the original model's terms are significant only in predicting two types of complaints, the chi-squared model's terms are significant in predicting all six types of complaints. Nevertheless, out of these six models, main and interaction effects are never simultaneously significant at least at 0.05 level,[73] signs of the effects are multidirectional between the models, thereby inconsistently indicating that in some cases the effects of the measures of fraud on post-electoral complaints are negative, and the number of individual type complaints is too small to build several models instead pooling all complaints into one.[74] In any case, the discrepancy between estimates of chi-squared and finite mixture models is far from reasonable and rather casts doubt on the modified version of Klimek's method.

Although f_i and f_e are probabilities with which each type of fraud occurs (i.e., units of measurement that can hardly be converted into vote shares), Mebane (2016: Table 1) presents the estimated vote shares for the Russian presidential and

[73] In "Campaigning" model, the interaction term is significant at 0.10 level. In other cases, at least one variable is completely insignificant.

[74] "Polling Place", "Party List", and "Campaigning" are exceptions (17.1%, 13.4%, and 9.2% of reported complaints per the number of observations, respectively), the percentages of other complaint types are too small: "Statistics" – 4.9%, "Counting" – 3.7%, and "Criminal" – 1.8%. See: Mebane et al. (2014: Table 3). A model with pooled complaints as well as one without the interaction term is not reported.

parliamentary elections. These estimates are, however, non-realistic – the amount of fraud is small and the estimates sometimes exceed the official incumbent's vote: 0.1% in 2004, –1.7% in 2007 (predicted = 66%, official = 64.3%), 1.2% in 2008, 1.3% in 2011, and –1.7% in 2012 (predicted = 66%, official = 63.3%). Even in the "worst election ever in Russia" the difference between the official and predicted United Russia's vote share amounts to 5.2% (Kalinin and Mebane 2016: Table 2).

Finally, Klimek et al. (2012) and the following papers do not account for heterogeneity of the data. Klimek and colleagues argue that their method is not vulnerable to the level of data – precincts, territories or regions (Table S3). To the contrary, Mebane et al. (2014: Table 1) show that the original and modified estimates of fraud vary widely between the levels of data. This can be explained by the fact that although a deviation from normality may be present in the pooled data, the distribution *within* lower-level territorial units can be nearly normal (see the distribution of votes in Dagestan in Figure 3.4, for example).

Thus, among the distribution-based methods, Sobyanin and Sukhovolsky's (1993) method seems to be the most relevant. It does not depend so crucially on the distribution of all other candidates' votes as Shpilkin's method (2011) and much simpler and unambiguous compared with Klimek and colleagues' method (2012). It should be stressed, however, that in the application of all three distribution-based methods the authors do not control for data heterogeneity (a partial exception is Kobak, Shpilkin and Pshenichnikov 2012). As it was underlined earlier, meeting data homogeneity assumption is decisively important for the validity of distribution-based methods. Therefore, any method from this set should be applied individually to each group of observations (ideally, at the first level of aggregation – TIKs in Russia) that can be deemed internally homogeneous.

Conclusion

This chapter has discussed methods of electoral fraud detection with the focus on observational data-driven and electoral data-driven methods. It has provided arguments that observational data-driven methods can hardly be applied for estimating the exact amount of fraud; they rather capture the overall bias of the electoral playing field. Furthermore, perceptual data, from which various indices of electoral quality are constructed, may be inherently biased. Perceptions of the ordinary citizens may reflect a general dissatisfaction with the government rather than quality of elections, or citizens as well as experts may simply not be aware of the exact extent of fraudulent practices. The allegations of fraud are ordinarily submitted by competing parties and therefore they are also potentially biased. Public opinion polls and exit polls are rather a poor alternative measure of the true vote since public surveys, equally as elections, can be subject to fraud in authoritarian regimes. While reports of electoral observers, especially if they are supplemented with copies of polling station protocols, are probably the most precise method in this group, their precision is crucially dependent on the degree of regime permissiveness regarding electoral monitoring and on the level of competence of observers.

Electoral data-driven methods also have their limitations. However, they seem more advantageous at least because they require fewer resources (the only requirement is availability of the official electoral data at the precinct level). Sample-based methods have an intrinsic deficiency related to the necessity of *a priori* accurate knowledge on the absence of fraud in the reference group. This requirement by no means always met. Although the analysis of the distribution of last digits reveals that vote percentages outperform raw numbers of votes conventionally tested by scholars for detecting fraud, the general verdict for digit-based methods is that they do not allow estimating the overall number of falsified votes but rather capture a limited spectrum of electoral fraud. In particular, digit-based methods do not detect fraudulent practices that occur before the vote count (vote buying, intimidation of voters, and ballot stuffing). Moreover, performance of digit-based methods can be decreased as a result of fraudsters' awareness of inadmissibility of round numbers or human-generated numbers: they may use random number generators, change only the first or the first two digits but not the last one, they may also take numbers from the real world (numbers of their houses, rooms or anything of this kind) to fill them in polling stations protocols.

Distribution-based methods are also not without limitations. In particular, validity of this group of methods is based on two assumptions: 1) the data are internally homogenous and 2) turnout and candidate votes are independent of each other. However, I have argued that these obstacles are surmountable primarily by analyzing precinct-level data separately for each territorial electoral commission (the first level of aggregation) – an approach that resembles hierarchical (multilevel) modeling.

Finally, apart from performance of methods reviewed in this chapter, the question on authoritarian adaptation deserves at least a brief consideration.

Researchers noticed that studies on electoral fraud and types of electoral fraud perpetrated by dictators may be to some degree interrelated. Sjoberg (2013) argues that web cameras were used strategically in the 2008 parliamentary election in Azerbaijan in order to create an image of electoral transparency. Specifically, turnout was by 7% lower in polling stations where web cameras were installed, while incumbent's vote share did not statistically differ between polling stations with and without online broadcast of the election process. Given than last-digit tests statistically indicate no fraud in polling stations without web cameras and a significant deviation from Benford's law probabilities in polling stations with web cameras, Sjoberg inferred that fraudsters have simply used different types of fraud: they relied more on ballot stuffing in polling stations without online broadcasting and, in polling stations with web cameras, compensated the reduction in fictitious votes by tampering with vote count after the broadcast was over. The vulnerability of digit-based election forensics method is apprehended by Medzihorsky (2015: 515) when he notes that the method "can be invalidated by deliberate behavior on the part of the fraudsters. In case they would deem it worth the costs, the fraudsters can adopt a variety of simple tools that will allow them to fabricate numbers with any digit distribution they desire".

Such concerns are not groundless. Even if fraudsters do not read the literature on election forensics (that is highly probable), they have their own criminal wisdom and the ability of empirical learning from election to election. At any rate, all relevant sources of public awareness of fraud are monitored by authoritarian leaders, and if methods of election forensics appear among these sources, they will be learned and counteracted after a while. From an existential point of view, this is a controversy that will ever exist until the world leith in evil. The purpose for researchers, observers and all people of good will interested in detection and prevention of electoral fraud is to be at least one step ahead of those who perpetrate it. This implies not only the elaboration of new methods of election forensics but also viewing and studying electoral fraud from different angles. While fraudsters can adapt to one or few methods of detection of electoral anomalies, they can hardly manipulate electoral process so that the manipulation could be undetectable by all methods reviewed in this chapter. In this regard, electoral data-driven methods should necessarily be supplemented by impartial electoral observation, trustworthy public opinion polls, and the taking information gained from participants of electoral process into consideration.

Chapter 4. Boosting Up the Victory: Electoral Fraud in the Russian 2000–2012 Presidential Elections

Introduction

The purpose of this chapter is to obtain robust region-level estimates of the initial (i.e., non-affected by fraud) vote shares for the incumbent presidents from 2000 to 2012 that will be used for the analysis in Chapter 6. The nation-level vote share is also important, yet it is of minor interest. As has been shown in the previous chapter, distribution-based methods are more reliable than the others. As has also been pointed out, too, heterogeneity may be present at the higher levels of aggregation and cause biased estimates. Thus, the method developed in this section is essentially an extension of Sobyanin and Sukhovolsky's (1993) approach applied separately to each territorial electoral commission (TIK), the first level of data aggregation, to avoid heterogeneity-related errors.

As a point of departure, I suggest separating the estimation procedure into two parts corresponding to two theoretically and mathematically different types of estimators. The first estimator for the initial (i.e., non-fraudulent) election outcome yields a candidate's *vote share estimate* based on quantile regression, or *QR estimate*. If subtracted from the officially reported vote share, the estimate transforms into the quantitatively estimated amount of fraud (in percentage points). The estimators of the second set correspond to the extent of deviation of the observed from the theoretically expected distribution of the vote, and they account, thereby, for qualitative assessment of fraud. For this purpose, I suggest using four *measures of electoral fraud* described later: *QR fraud*, the median absolute deviation of turnout and residuals (*MADT and MADR*, respectively), and chi-squared statistic for the deviation of the last-digit frequencies in the incumbent's vote share from Benford's law ($\chi^2_{LBL\%}$).

At the first glance, this variety of electoral fraud indicators may seem superfluous since the quantitative amount of fraud as the percentage-point difference between the official vote and the real electoral result is likely to be correlated with the general distortion of electoral data measured in abstract units. At the same time, both quantitative and qualitative magnitudes of fraud should not correlate with the vote share estimate (i.e., with the level of true vote). However, if electoral data are extremely fraudulent, any quantitative vote share estimate intrinsically tends to be biased. As it was discussed in Chapter 2, electoral fraud may take multiple forms, including the most drastic of them – filling fictitious numbers in polling station protocols. A combination of these malicious practices is a common place in authoritarian elections: election day at an individual polling station may begin with some quantity of ballots already stuffed in the ballot box before voting process started, an additional amount of forged ballots can be stuffed in the result of "carousel" voting, ballots then can be deliberately miscounted, the members of polling station electoral commission can even "prettify" the reality by reporting a larger (also fictitious) number of incumbent's votes to the territorial electoral commission (TIK), the members of TIK's electoral commission can "adjust" the number before inputting it into the national electronic voting system (*GAS "Vibory"* in Russia), and finally there is no warranty that electoral data will not be manipulated in the electronic system. With each action of such forgery, electoral data diverge farther and farther from theoretically unbiased distribution that hampers drawing the formal inference regarding the initial (non-fraudulent) election result.

Put differently, the bias in the vote share estimate increases with the amount of fraud. When electoral fraud is absent, the data are distributed in conformity with theoretical expectations and the vote share estimate demonstrates its maximal precision – it coincides with the official vote share. In the case of minor electoral malpractices, the data slightly diverges from theoretical expectations and there is relatively easy to "clean" it of fraud. This task becomes harder at considerable levels of fraud. And after some moment (in such cases where nearly all votes are counted as incumbent's votes), any procedure for estimating the incumbent's authentic vote share produces unreliable results. In this connection, having various qualitative measures of electoral fraud allows us to take this bias into account in two ways. First, the most unreliable observations with extreme levels of electoral data distortion can be filtered. This chapter uses cluster analysis for this purpose. Second, if the vote share estimate correlates with the qualitative measures of fraud, indicating thereby that bias exists, it can be detrended of this correlation. For this purpose, I regress the QR estimate on the four measures of fraud and other variables that are expected not to correlate with the vote share estimate and create an adjustment based on fitted values of the model.

The results of the study confirm validity of this approach. First, on average between elections of 2000–2012, 145.5 out of 1936.3 TIKs have been attributed to the 4th cluster in the result of cluster analysis. This cluster includes observations with extreme levels of fraud (the incumbent's vote share is equal to 90.0%, on average between elections) the genuine share of the vote in which cannot be reliably estimated. The cluster is characterized by the minimal mixing probability, that is, it apparently the most distinct cluster. Second, as expected, the estimated incumbent's vote share is dependent on the amount of fraud measured by the four qualitative variables of fraud and on two auxiliary variables. The models explain 54.9%, 55.4%, 43.8%, and 27.4% of the QR estimate's variance in 2012, 2008, 2004, and 2000, respectively. As Appendix D6 show, this relationship varies by cluster: it is modest (R-squared = 16.1%, on average in 2000–2012) in the 1st cluster (the cluster of the least fraud) and increases to its maximum (R-squared = 56.6%, on average in 2000–2012) in the 3rd cluster (the cluster of widespread fraud). The results of the analysis show the following ranking of the presidential elections according to the scope of electoral fraud: 1 – 2000, 2 – 2004, 3 – 2012, and 4 – 2008, whereas the largest difference is detected between the election of 2000 and all subsequent elections.

This chapter unfolds as follows. The first section develops a method for estimating the initial (i.e., non-falsified) incumbent's vote share based on quantile regression. The second and third sections introduce three qualitative measures of electoral fraud. I do not dwell specifically on the description of the fourth measure of fraud ($\chi^2_{\mathrm{LBL}\%}$) since this was done in Chapter 3. In two subsequent sections, these measures are used in cluster analysis and in regression modeling to make an adjustment for the quantile regression estimate of the incumbent's vote share. Since the algorithm for estimating electoral fraud is identical between elections, I use electoral data of the recent presidential election of 2012 in the main text and report the results of the analysis for the elections of 2008, 2004, and 2000 in Appendix D3, D4, and D5, respectively. The penultimate section presents a comparison between the elections of 2000–2012 based on the elaborated measures of fraud to trace the dynamics of electoral fraud throughout the period of study. Finally, findings of the chapter, including theoretical implications regarding the role of electoral fraud in electoral authoritarian regimes, are summarized in the conclusion.

QR Estimate

It was remarked in the previous chapter that in a fraud-free electoral contest, given the estimated equation $V_i^I/E_i = \alpha + \beta T_i$, β should approximately equal the candidate's vote share and α should equal zero. On this basis, the β-coefficient is a straightforward measure of the estimated vote share. Electoral fraud, however, causes α to deviate from zero and β to exceed the share of the candidate's vote. The idea of robust estimation is to find a measure that allows us to estimate the equation at that level of the conditional distribution where α approaches zero. This condition may be met inasmuch as not all observations are typically exposed to fraud. To cope with this task statistically, the analysis relies on quantile regression.

In brief, quantile regression is a method to study the relationship between variables at different levels of their conditional distribution (Koenker 2005; Davino, Furno and Vistocco 2013). Applications of quantile regression are well known in many quantitative fields of research including economics and econometrics, medicine, ecology, biology and environmental studies, yet not in political science and sociology (Hao and Lingxin 2007).

This methodological lag seems quite unexpected given that the quantile regression approach is advantageous at least for two reasons. First, quantile regression substantially outperforms traditional least squares regression over a wide class of moderately skewed distributions with outliers, which particularly appear in fraudulent electoral data. Low robustness of the OLS estimator to outliers and its poor performance in many non-Gaussian, especially long-tailed, distributions has been a rationale for introducing "regression quantiles" (Koenker and Basset 1978). While the ordinary least squares (OLS) estimator minimizes the sum of *squared* deviations thereby attributing disproportional weight to outlying observations, the quantile regression (QR) estimator avoids the problem related to squaring by minimizing the sum of *absolute* deviations.

Second, quantile regression makes possible to obtain estimates varying by levels (quantiles) of the conditional distribution when the homoscedasticity assumption is not met. In particular, this tool can be especially useful for distinguishing between fraudulent and non-fraudulent observations in electoral data. Specifically, different types of electoral fraud commonly lead to an upward shift of the affected observations on the scale of turnout or the vote share or on both, whereas non-affected observations remain located at lower levels and can be tapped by corresponding (lower) regression quantiles.

Thus, the *QR estimate* of the initial (i.e., not-affected by fraud) vote share is computed according to the following algorithm applied to each group of cases i, which is a territorial electoral commission (TIK), where the cases (i.e., the units of analysis) are precinct electoral commissions (UIKs):[75]

i) The set of QR models[76] $V_i^I/E_i = \alpha + \beta T_i$ is estimated at τ = 0.05, 0.1, 0.15,..., 0.5,[77] where tau denotes regression quantile, V_i^I denotes the number of votes cast for the incumbent candidate *I*, E_i denotes the number of eligible voters, hence V_i^I/E_i signifies the absolute vote share of the incumbent and T_i refers to turnout.[78]
ii) The model having the closest to zero intercept, or equivalently *QR model at tau|α->0*, is chosen from this set of ten models.
iii) Given the model's parameter estimates, the estimated share of incumbent's votes V_i^I in valid votes V_i, or *QR estimate*, is defined by the formula: $\widehat{V_i^I/V_i} = (1 \div \overline{T_i}) \cdot (\alpha + \beta\overline{T_i})$[79], where $\overline{T_i}$ is the mean of turnout.

Consider, for example, the presidential election of 2012 in Voronezh Oblast (see Figure 4.1). The population-weighted means of α = -0.076, β = 0.658 (see the dot-dash line), and turnout = 0.671. Firstly, we calculate the predicted absolute share of Putin's votes (the right-hand side of the equation in step iii):

[75] In the Russian 2012 presidential election, the number of UIKs (excluding the territory abroad the country) amounted to 95,039, the number of TIKs was equal to 2,742, and these were subordinate to 83 regional electoral commissions. In other federal elections these numbers are slightly different.
[76] For computation details see Koenker (2006), Appendix A in Davino et al. (2013), and Appendix D2 in this dissertation.
[77] In this simple version described hereafter, the candidate is presumably a beneficiary of rigged votes, hence using tau at higher levels is unreasonable. A more complex approach in more uncertain circumstances would be testing probabilities of fraud between several candidates, involving the full range of quantiles.
[78] To avoid a bias related to small number of cases in the model, only TIKs having twenty and more UIKs are included in the analysis. Since QR assumes variability in conditional quantiles, TIKs having zero standard deviations of the absolute vote share (that usually corresponds to 100% of the vote in all precincts) have also been filtered. Applying these criteria to the presidential election of 2012 gives 85,905 valid cases out of total 95,424 UIKs grouped into 2,047 TIKs (out of the overall 2,744 TIKs) and accountable for 100,323,739 eligible voters in the election (out of the total 109,860,331 voters).
[79] Note: since the QR model is based on the absolute vote share $[V_i^I/E_i]$, the notation $(1 \div \overline{T_i})$ transforms V_i^I/E_i estimate obtained at the given level of turnout $[\alpha + \beta\overline{T_i}]$ into the ordinary vote share $[V_i^I/V_i]$. A simpler approach for obtaining V_i^I/V_i would be a summation of α and β at $T_i = 1$. However, the former approach is preferable since the estimate obtained at the central point of the turnout distribution is more robust than the marginal estimate in cases where α deviates from zero.

$\widehat{V_i^I/E_i} = -0.076 + 0.658 \times 0.671 = 0.366$. Then we define the relative (ordinary) vote share: $\widehat{V_i^I/V_i} = (1 \div 0.671) \times 0.366 = 0.546$ or 54.6 percent.

QR Fraud

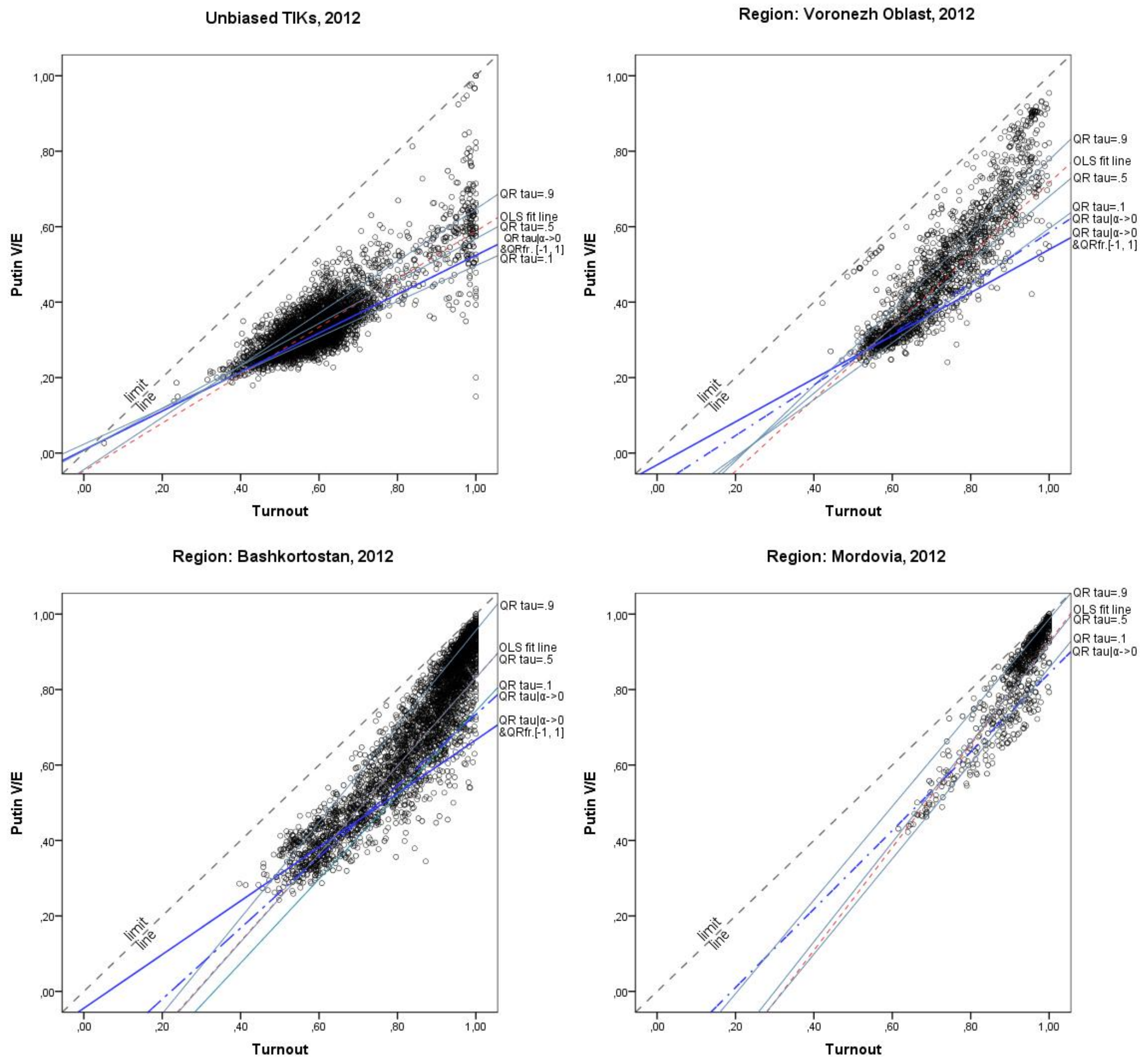
Having obtained QR model parameter estimates at tau = 0.5, we may proceed to defining the first qualitative measure of electoral fraud that is hereinafter denoted by *QR fraud*. It was shown in Chapter 2 that the function of ballot stuffing is $V_i^I/E_i = \alpha + 1T_i$, while values of β higher than one indicate rewriting of electoral commissions' protocols with transferring votes from one candidate to another. Hence, the idea behind QR fraud is to measure the extent to which the parameters of quantile regression correspond to this empirical prediction by using the ratio of Y-intercepts at $T_i = 0$ and $T_i = 1$ obtained from QR model $V_i^I/E_i = \alpha + \beta T_i$ at $\tau = 0.5$. Thus, QR fraud is defined as follows:

$$F_{iQR} = \frac{\alpha}{1 - (\alpha + \beta)}$$

QR fraud takes negative values if the candidate benefited from fraud and positive values if fraud ended up with vote loss, whereas zero value indicates the absence of fraud. In quantitative terms, QR fraud is easily interpretable: varying within the interval [-1, 1], it may be understood as the share of polling stations impacted by ballot stuffing. In case of extending beyond this interval, it implies the share of polling stations where, additionally to pervasive ballot stuffing, votes of one or several candidates were counted as another candidate's votes. For example, if α = -0.23 and β = 0.98 then the share of polling stations that have been exposed to falsification commensurable to ballot stuffing equals *0.23 / (1 – (-0.23 + 0.98)) = -0.92* or 92 percent. Surely, QR fraud may take values extending beyond the interval [-2, 2]. However, such cases couldn't have a proper quantitative interpretation, the interpretation should rather be qualitative, namely, that the published election results are absolutely fictitious.[80]

[80] It must be clarified that even though the electoral data are strongly manipulated, the actual election result, theoretically, may coincide with the official numbers. Nonetheless, the official data in this case are so highly distorted that any drawn inference is utterly unreliable.

Figure 4.1. Performance of quantile regression estimates at various tau



Note: Lines represent fitted values obtained from OLS and quantile regression models. QR parameter estimates were firstly obtained at the level of TIKs and then averaged for regions by calculating means weighted by number of eligible voters. QR tau|α->0 implies that the only QR model having closest to zero intercept was chosen from the set of ten QR models at tau = 0.05, 0.1, 0.15,... 0.5. Additionally to this condition, QR tau|α->0 & QRfr. [-1, 1] adds the restriction that QR fraud falls into the interval [-1, 1]. Since the latter condition is too strict for Mordovia, whereby selecting no cases, only QR tau|α->0 line is shown. For Unbiased TIKs only QR tau|α->0 & QRfr. [-1, 1] is shown since it coincides with QR tau|α->0 having intercepts = 0.0082, 0.0081 and coefficients = 0.5159, 0.5158, respectively.

To show the difference between several kinds of estimates, Figure 4.1 presents fit lines for OLS and QR estimates at various tau and with additional conditions imposed by tau selection and QR fraud. Four types of elections varying by the extent of electoral fraud have been chosen for this purpose. Unbiased TIKs have been chosen by ocular detection as TIKs where the following condition is met: $\alpha \approx 0,\ \beta \approx V_i^I/V_i$. Voronezh oblast represents slightly distorted data, Bashkortostan represents highly distorted data, and Mordovia is the case of extreme fraud. Figure 4.1 generally suggests that QR estimates at τ -> 0 combined with the restriction imposed by QR fraud performs at an acceptable level even if electoral data are substantially distorted. It also shows that the fit line of QR estimates at τ -> 0 falls even below the fit line of 10th quantile at $T_i = 1$ if the data are strongly distorted. The fact that the QR model at tau|α->0 visibly provides more correct estimates than QR model at any other tau implicitly confirms that it is not lower regression quantiles that matter as such but only particular quantiles the intercepts of which are closer to zero, as theory predicts.

For unbiased TIKs, the distinction between OLS and QR estimates is small. In this case, the OLS estimate (56.1%) is almost identical with the official vote share (56.0%), while the QR estimate is three percentage points smaller (53.0%).[81] Electoral data from Voronezh Oblast are moderately distorted, QR fraud indicates that about 37%[82] of precincts experienced a falsification commensurable to ballot stuffing. These two groups of observations are clearly visible in the graph. The QR fitted line at tau|α->0 and QR fraud [-1, 1] passes nearly through the center of non-distorted observations, while OLS line is deflected upward under the influence of the deviating cases. Quantitatively, there is a 10-percent difference between the QR estimate (52.4%) and the official result (62%).

The data of Bashkortostan are distorted to an even greater extent. As QR fraud indicates (-1.27), attaining such result solely by means of ballot stuffing is improbable, hence a sizable amount of the competitors' votes has been simply counted as incumbent's votes. This is well noticeable in Bashkiria's graph that the electoral data are heterogeneous. The urban area is predominantly located in the range of turnout smaller than seventy percent; the incumbent's vote is relatively constant throughout the whole range of turnout in this group, whereas the incumbent's vote tends to increase together with turnout in the rural area.

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[81] QLS and QR estimates are calculated by the formula $\widehat{V_i^I/V_i} = (1 \div T_i) \cdot (\alpha + \beta T_i)$ for each TIK and then averaged using the mean weighted by number of eligible voters. The sameness of the OLS estimate and the official vote share is explained by the fact that the OLS line naturally passes through the mean points of both variables (i.e., the OLS estimate at the level of mean T_i equals the mean V_i^I/V_i).

[82] Since many QR fraud distributions are highly skewed, median values weighted by the number of eligible voters are reported.

Although the former group is obviously characterized by a lesser degree of fraud, it cannot be used as a perfect benchmark for a non-fraudulent election since the intercept of QR fit line at tau|α->0 even with the restriction of QR fraud [-1, 1] does not approach zero so closely as in the two previous graphs that makes the estimation slightly less reliable. Nevertheless, the QR estimate (64.8%) is considerably smaller than the electoral commission's result (75.9%).

Mordovia gives an example of highly adulterated election where the initial vote share cannot be reliably estimated. The QR estimate for this region is 82.3%, which is somewhat smaller than the official number of 87.6%. Nevertheless, QR fraud is enormous – -5.9. Moreover, all values of QR fraud in each of the 21 TIKs in the region are negative, where the value of minimally distorted TIK equals -1.3 and reaches an astonishing -53.2 at the most fraudulent TIK, thereby signifying that the election result is fully untrustworthy.

MADT and MADR

Two additional indicators are used in the analysis to tap fraudulent electoral data more efficiently. It has been shown in Chapter 2 that electoral fraud predominantly leads to larger ranges and standard deviations on X and Y axes. Two particular types of fraud – "in a line" and "in a dot", on the contrary, lead to extremely small standard deviations. Oversized standard deviations (SDs) have also been pointed out as an alternative metrics of election anomalies by Kobak, Shpilkin and Pshenichnikov (2012: 3-4) and Klimek et al. (2012). However, using SDs as a measure of fraud entails at least three problems. First, standard deviations of the vote share tend to become larger with the growth of the overall vote share as the slope of the regression line becomes higher (see Figure 3.3, for example). Second, the type of falsification "in a line" cannot be detected only by the standard deviation of vote share. Consequently, the relationship between X and Y should be considered. And third, the SD is virtually the mean squared deviation from the data's mean and therefore it has the same shortcomings caused by squaring as the OLS estimator, namely, hypersensitivity to outliers and poor performance on skewed distributions.

To overcome these difficulties, I suggest using two measures of fraud for X and Y axes based on the median absolute deviation. Thus, the median absolute deviation of turnout, or *MADT*, at the level of territorial electoral commission (TIK) i is defined as the median M_i of absolute deviations of turnout T at each precinct (UIK) j from the data's median $M_i(T_i)$, so that:

$$MADT_i = M_i\left(\left|T_j - M_i(T_i)\right|\right)$$

Analogously, the median absolute deviation of residuals, *MADR*, is defined by the formula:

$$MADR_i = M_i\left(\left|R_j - M_i(R_i)\right|\right),$$

where R_j is the residual term obtained from the QR model $V_i^I/E_i = \alpha + \beta T_i$ at $\tau = 0.5$.

As with the SD, enlarged MADT signifies that turnout has been artificially inflated, more likely, in the result of ballot stuffing or forging of polling station protocols at the precinct level (i.e., if electoral fraud is not managed from a single place when electoral data on several polling stations are available). Unnaturally small values of MADT correspond to falsification “in a dot”. MADR is interpreted like the mean squared error from an OLS model: the greater the MADR, the greater the distance of the median observation from the fitted line. Thus, the greater values of MADR are typical for cases where the opposition’s votes are counted as incumbent’s votes and given simultaneously enlarged MADT they indicate ballot stuffing. Extraordinarily small values of MADR, in its turn, indicate falsification “in a line”.

Since any theoretical predictions on allowable values of MADT and MADR are absent, one approach could be using upper and lower percentiles of MADT and MADR obtained from unbiased polling stations as empirical benchmarks for a non-fraudulent election. Descriptive statistics for these variables in unbiased TIKs are reported in Table 4.1.

Table 4.1. Characteristics of unbiased territorial electoral commissions, presidential election of 2012

	N	Mean	Std. Deviation	5th Percentile	95th Percentile	Skewness	Kurtosis
N of UIKs in TIK	100	51	27.82	26.1	123.1	1.87	4.92
MADT	10574487	.0532	.0171	.0308	.0843	.786	.088
MADR	10574487	.0187	.0058	.0115	.0272	1.631	4.639
QR fraud	10574487	-.0342	.1918	-.2944	.1709	-2.995	14.359
QR estimate at tau | α -> 0	10574487	.5301	.0471	.4546	.6184	.376	.113
Putin V_i^I/V_i	10574487	.5600	.0448	.4985	.6522	.576	.461

Note: N of UIKs in TIK is the number of precincts in a territorial electoral commission. For computation of all other statistics, cases are weighted by eligible number of voters. For this reason, the number of observations (N) increased in the corresponding cells. MADT and MADR denote median absolute deviations of turnout and residuals of the QR model Putin $V_i^I/E_i \sim T_i$ at tau=.5, respectively. Putin V_i^I/V_i is the ordinary vote share calculated as ratio of the candidate's votes to valid votes.

The table suggests that QR fraud does not detect a substantively significant distortion of the election results in the selected TIKs. Putin's official vote share and its QR estimate relying on the values of skewness and kurtosis are distributed closely to normal distribution that also indirectly indicates non-biasness of the electoral data. The mean values of MADT (0.053) and MADR (0.019) indicate that, among the unbiased TIKs, the reasonable range of turnout does not exceed 21.1% (1.98 MADT to the left and to the right from the mean at 95-percent level) and that the reasonable range of the conditional distribution of the vote share on turnout is equal to 7.4% (at 95-percent level). However, the table also shows that MADR is strongly skewed, which makes establishing empirical benchmarks problematic. Moreover, the benchmark-based approach has a disadvantage related to ambiguity of interpretation of values falling outside the allowable thresholds. Theoretically we may assume a uniform effect of exceeding values on the extent of fraud, for instance, that doubled MADT or MADR indicates that all observations randomly shifted from their initial positions. Yet uniformity of the effect in relation to values falling beyond the lower boundary is not so obvious. Imagine a number of TIKs having the initial vote shares and turnout rates about 60% and varying by degree of falsification "in a dot", where the target point for falsifiers is located closely to 95% of turnout and vote share. In this case, MADT and MADR should firstly increase due to enlarged ranges of the distributions and only when the data of more than a half of UIKs within the TIK are altered, MADT and MADR should begin to shrink directionally to zero.

Cluster Analysis

Another empirical approach is to define clusters in electoral data based on our measures of fraud. Gaussian mixture modeling fitted via the Expectation-Maximization algorithm for model-based clustering that applies Bayesian Information Criterion (BIC) to identify the most likely model and number of clusters is used for this purpose (for more details see: Fraley, Raftery, Murphy and Scrucca 2012). The maximal number of clusters has been set up at 4 since the bigger number of clusters makes interpretation unnecessarily complicated. The model includes five variables: the incumbent's official vote share, QR fraud, MADT, MADR, and chi-squared statistic for the deviation of the last-digit frequencies in the incumbent's vote share from Benford's law ($\chi^2_{\mathrm{LBL\%}}$), which is described in Chapter 3. Putin's vote share is involved since the focal point is not to define clusters in various estimates of fraud but to define clusters in the electoral data conditionally on the extent and types of fraud specified by the measures of electoral distortion.

Thus, this section presents the cluster analysis of the incumbent's vote and four measures of electoral fraud for the presidential election of 2012 in order to classify the incumbent's vote according to the degree of distortion of the data under the impact of fraud into four groups: 1) no-fraud or nearly unaffected by fraud observations, 2) moderately affected by fraud observations, 3) strongly affected by fraud observations, and 4) the observations of extreme fraud in which the QR estimate is not reliable and the incumbent's authentic vote share is virtually undetectable. QR estimates of the vote in the first three groups can be adjusted according to the level of fraud, while observations of the fourth group can only be filtered (these tasks are performed in the next section). So long as our four measures of fraud are summarized in the cluster analysis, I do not allocate individual election-specific sections for them. Instead, election-specific results of the cluster analysis and of the adjustment for the QR estimate for the presidential elections of 2000–2008 are presented in Appendix D3–D5. This section examines the presidential election of 2012.

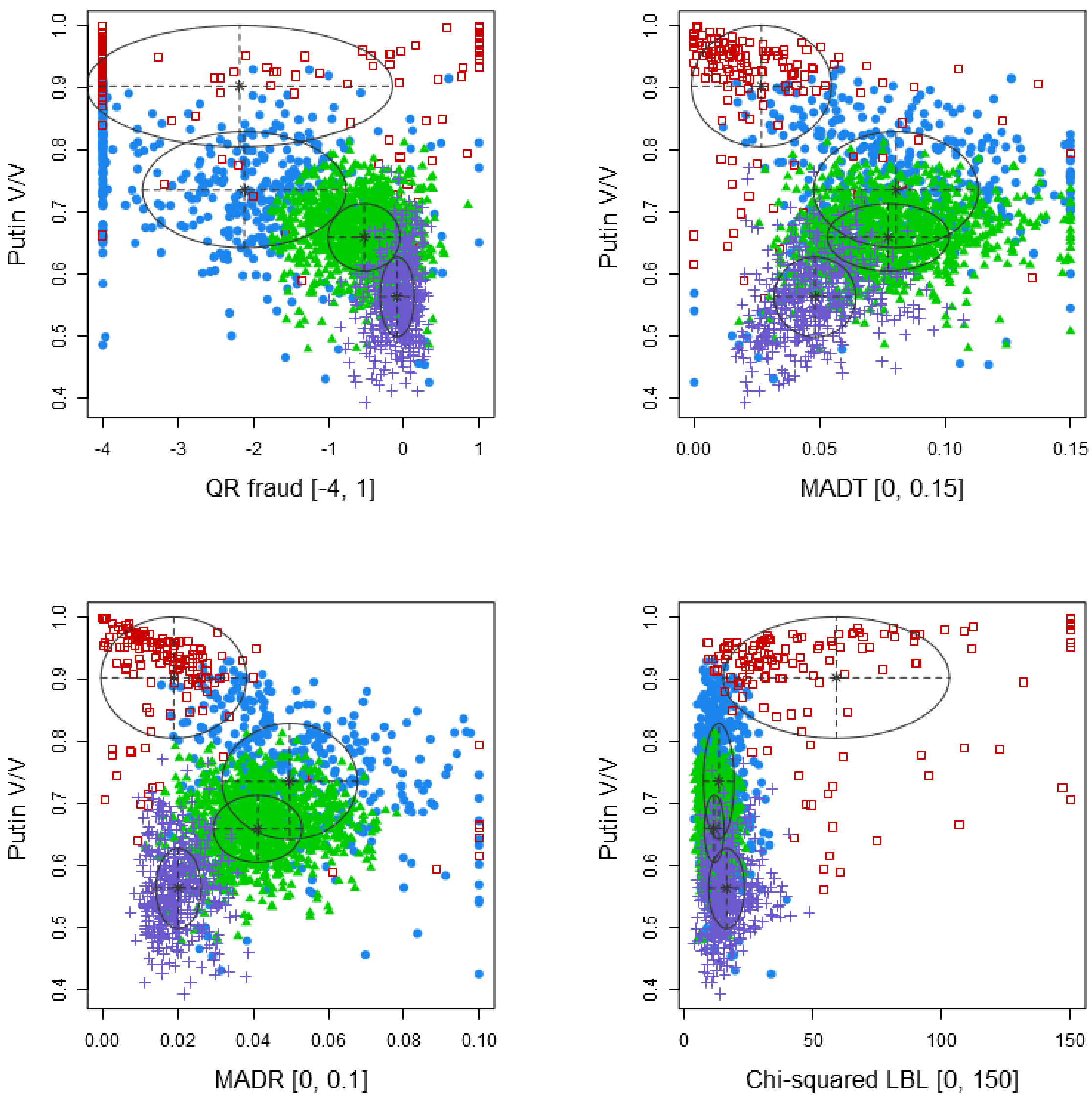
All four variables of fraud are skewed due to multiple outliers. In 30 or 1.5 % of cases, QR fraud takes negative or positive values extending beyond the interval

[-50, 50], 5.5% of cases fall beyond the interval [-10, 10], and 9.8% of cases extend beyond [-4, 4]; 39 cases (1.9%) of MADT exceed 0.15 reaching the maximum of 0.25; 15 cases (0.7%) of MADR are greater than 0.10, with the maximum of 0.41; and 20 cases (1%) of $\chi^2_{\mathrm{LBL\%}}$ have values greater than 150, with the maximum of 405. These extreme values fall beyond any reasonable intervals, moreover, they entail a bias in clustering since heterogeneity within main groups of observations becomes less pronounced due to the inflated variances caused by outliers. For this reason, the variables have been censored and their extreme values have been recoded into values defined by more reasonable limits.

Fitting Gaussian mixture modeling for the presidential election of 2012 yields four clusters in Putin's share of the vote varying by degree and type of electoral fraud. The results are graphically shown in Figure 4.2. As to QR fraud, the standard deviations (SDs) of the clusters indicated by ellipses do almost not overlap. The clusters are also distinct if Putin's vote is plotted against three other variables of fraud, yet in varying degrees. The most distinct is the 4th cluster (the clusters are ranked in ascending order based on Putin's vote). It contains extremely positive and extremely negative observations on QR fraud scale, observations $\chi^2_{\mathrm{LBL\%}}$ values of which are high and significant (at $p < 0.01$ if chi-squared is over 21.67), and multiple observations < 0.2 on MADT scale and < 0.1 on MADR scale. These are the observations of extreme fraud, fraud that highly likely takes the form of rewriting of polling station protocols with forging the incumbent's vote and turnout in very narrow ranges – the types of falsification that I call "in a line" and "in a dot". The SDs of the 1st cluster do also not overlap with the SDs of other clusters, even though the 1st cluster is not as distinct as the 4th cluster. The SDs of the 2nd and 3rd cluster overlap on the scales of three variables of fraud, yet the clusters are distinct enough.

In a more formal way, the degree of distinctiveness between the clusters is indicated by mixing probabilities reported in Table 4.2, where higher mixing probability (MP) is associated with higher uncertainty and smaller distinctiveness. Observations of the 4th cluster are apparently the most unique (MP = 0.0766), the model shows the highest uncertainty regarding the 2nd cluster (MP = 0.4714), and the 1st together with the 3rd cluster are moderately and similarly distinct (MP = 0.2244 and 0.2276, respectively).

Figure 4.2. The measures of electoral fraud versus the official vote share marked by clusters, 2012



Note: Ellipses indicate means (centers) and standard deviations by cluster.

As follows from Table 4.2, 94 out of the 100 unbiased TIKs are grouped in the 1st cluster, which may also be referred to as the cluster of unbiased TIKs. The difference between the average official and the average estimated Putin's vote share amounts to 2.9% (0.5638 versus 0.5349, respectively) in this cluster. The variable of QR fraud is skewed, as the discrepancy between its mean and median indicates, nevertheless, QR fraud shows that not more than 8.2% of polling stations have been exposed to fraud commensurable to ballot stuffing. This group of the relatively free-of-fraud TIKs includes 467 (22.8%) of cases.

In the 2nd cluster, the difference between the official and the estimated incumbent's vote is larger – 5.4%. QR fraud indicates that about a half of the observations have been affected by an analogue of ballot stuffing. This is alternatively confirmed by nearly doubled MADT and MADR – recall that turnout and the candidate's vote share increase simultaneously as a result of ballot stuffing. This cluster contains nearly a half of all cases – 1013 (49.5%).

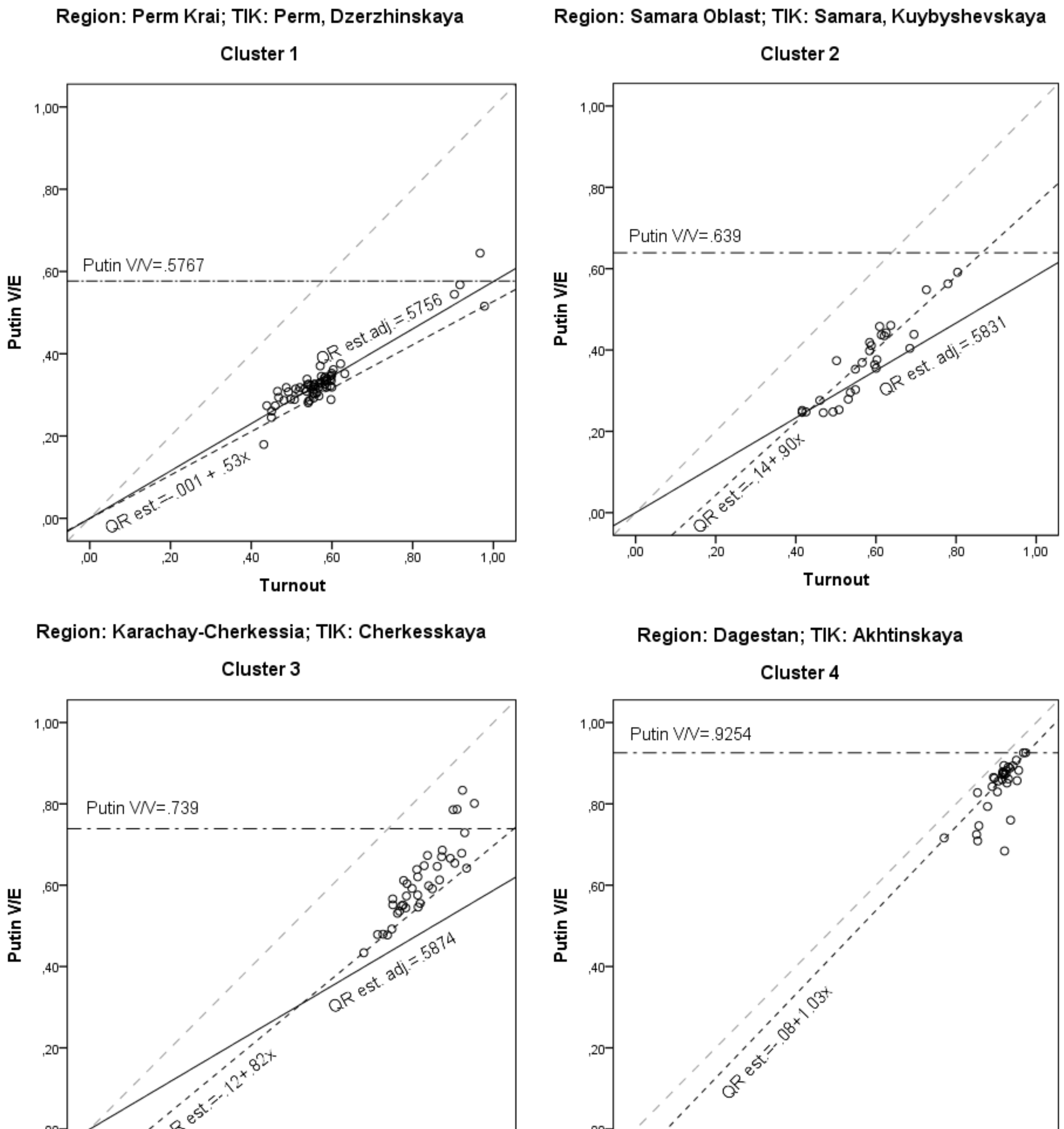
Table 4.2. Descriptive statistics for the official incumbent's vote share, QR estimate, and the measures of fraud by cluster, 2012

Cluster	Descriptive Statistics	Putin V_i^I/V_i	QR Estimate	QR Fraud [-4, 1]	MADT [0,0.15]	MADR [0,0.1]	$\chi^2_{LBL\%}$ [0,150]	Mixing Prob-s	N	N of Unbiased TIKs
1	Mean	.5638	.5349	-.0820	.0479	.0199	16.5	.2244	467	94
	Median	.5605	.5298	-.0428	.0462	.0193	15.3			
	St. Dev.	.0645	.0679	.2253	.0162	.0058	6.9			
2	Mean	.6612	.6072	-.5360	.0779	.0414	11.6	.4714	1013	6
	Median	.6618	.6075	-.4910	.0754	.0403	11.2			
	St. Dev.	.0538	.0677	.4714	.0246	.0116	3.7			
3	Mean	.7439	.6762	-2.333	.0801	.0508	13.6	.2276	413	0
	Median	.7462	.6723	-2.14	.0772	.0478	12.5			
	St. Dev.	.0940	.1164	1.309	.0330	.0184	6.0			
4	Mean	.9072	.8910	-2.164	.0262	.0184	60.0	.0766	154	0
	Median	.9377	.9358	-3.63	.0184	.0143	45.1			
	St. Dev.	.0957	.1249	2.048	.0280	.0193	44.0			

Note: The statistics are reported for the variables used in the cluster analysis where outliers have been recoded into values indicated in the limits of the variables' titles. The statistics of non-recoded variables do not deviate substantively from those presented in the table except the means of QR fraud of the 3rd and 4th clusters. $\chi^2_{LBL\%}$ denotes chi-squared statistic for the deviation of the last-digit frequencies in Putin's vote share from Benford's law, where all digits' expected probability, according to Benford's law, is equal to 0.1. Significance levels: 14.69 – p < 0.1, 16.92 – p < 0.05, 21.67 – p < 0.01, 27.88 – p < 0.001.

As we turn to the 3rd cluster, the difference between Putin's vote and the QR estimate increases to the maximum of 7.4%. The average QR fraud exceeds two, indicating thereby that the official incumbent's vote share (74.4%), especially if compared with the vote share of the 1st cluster (56.4%), is unlikely to be reached only by means of ballot stuffing; in many of these TIKs (especially in those 233 where QR fraud > 2) opposition candidates' votes were transferred to the incumbent. This group of blatant fraud includes 413 (20.2%) of cases.

Figure 4.3. Four typical "fingerprints" of fraud: The most empirically representative TIKs by cluster, 2012



Finally, the 4th cluster consists of 154 (7.5%) cases of extreme fraud. Electoral data are affected by fraud so heavily that the QR estimate is smaller only by about one percent than the official vote share in this group. As expected, the QR estimate becomes not sensitive to fraud after some threshold. Using the lower quantiles of the data allows to define the real vote share if at least some quantity (say, 10–30% depending on the number of observations) of polling stations is not affected by fraud. However, if election results in all or nearly all polling stations are fictitious, the probability of valid estimation of the initial vote share approaches zero. The artificiality of electoral data in the 4th cluster is also confirmed by an unnaturally small MADT (if compared with the 1st cluster) and by the great average value of $\chi^2_{\mathrm{LBL\%}}$, which is significant only in this cluster.

For illustrative purposes, Figure 4.3 displays four most typical “fingerprints” of electoral fraud in the presidential election of 2012; each TIK of them is the best empirical representative of its own cluster. The TIKs are selected based on the least absolute total deviation of the variables in analysis from their cluster-specific medians presented in Table 4.2 (see Appendix D2 for details). Looking ahead, plots in Figure 4.3 show lines for the adjusted QR estimate, which is developed in the next section. In the 1st cluster, the QR estimate (52.7%) passes through the lower part of the conditional distribution and somewhat underestimates the real vote share. The adjusted QR estimate, which passes through the center of the distribution, corrects this bias. It makes the estimate (57.6%) almost equal to the official vote share (57.7%). This is quite reasonable given that QR fraud (0.0015) indicates no fraud at the TIK.

In the 2nd cluster, there is heterogeneity of the distribution: nine observations are distinctly located in the area of low turnout and vote share (turnout < 0.6, Putin V_i^I/E_i < 0.3). However, the QR estimate does not detect this group (probably, because of the relatively small number of observations); the intercept of the QR fit line deviates considerably from zero (-.14). Nevertheless, the adjusted QR estimate passes through this group of observations and shows the estimated vote share (58.3%) by 5.6% smaller than the official vote share (63.9%).

In the 3rd cluster, electoral fraud took place at all polling stations, including counting of opposition votes as incumbent votes (QR fraud = -1.89). Although the QR fit line passes through the lowest quantile (τ = 0.05), its intercept is again stands far from zero (-.12). Consequently, even though the QR estimate (67.0%) is smaller than the official vote share (73.9%), it cannot be deemed unbiased. The adjusted QR estimate takes the relationship between the QR estimate and various measures of fraud into account and shows that a more adequate level of the incumbent’s vote should be equal to 58.7%, even though this estimate is beyond the empirical range of observations.

In the 4th cluster, the data are so heavily manipulated that any adjustment would be irrelevant. QR fraud (-1.69) shows that all UIKs have been exposed to fraud. MADT (0.0243) is almost two times smaller than the average MADT of the 1st cluster (0.0479) that in combination with the large value of $\chi^2_{\mathrm{LBL\%}}$ (45.3) substantiates the hypothesis about the type of falsification "in a dot" at this TIK. More specifically, 13 out of 32 (40.6%) numbers in the last digit of the incumbent's vote appear to be fives (i.e., numbers corresponding to Putin V_i^I/V_i= 95%), as well as 10 (31.3%) last-digit numbers in the turnout rate are twos (turnout = 92%), whereas Benford's law predicts uniform probabilities for each number equal to 10%.

Adjusted QR Estimate

As the cluster analysis has shown, the electoral data vary considerably by the extent of fraud. The reliability of the QR estimate also varies by cluster: it is fully reliable for the 1st cluster, less reliable for the 2nd and the 3rd cluster, whereas any estimates for the 4th cluster are untrustworthy. To cope with this variability, this section introduces an adjustment for the QR estimate that takes into account the relationship between the QR estimate and the four measures of fraud plus two additional variables that should presumably not correlate with the QR estimate – regression quantile (tau) from the regression model used for obtaining the QR estimate and turnout.

Before proceeding to elaborating of the adjustment for the QR estimate, consider the main assumption that underlies it. The QR estimate of the initial, authentic or sincere incumbent's vote should theoretically be independent of fraud: it should neither increase nor decrease with the level of any measure of fraud. This assumption should intuitively be valid. However, Rundlett and Svolik (2016) challenge it by arguing that local agents as perpetrators of fraud are more prone to engage in this risky affair in a situation of the least potential costs, that is, when the incumbent is genuinely popular and the probability of criminal prosecution by the challenger if the incumbent loses the election is small. I dwell on a more detailed consideration of this argument in the concluding chapter when I discuss the reasons of resorting to fraud by authoritarian leaders. For the purpose of this chapter, I briefly summarize the main counterarguments.

First, in the cross-regional context of the national elections, there is no obvious reason for elites of a region where the level of the incumbent's vote is genuinely high (suppose Tatarstan, for example) to perceive the probability of post-electoral criminal prosecution if the challenger were to win the election lower than for elites of a region where the level of the incumbent's vote is genuinely low (in Belgorod

Oblast, for example) so long as if the incumbent will be defeated, he will be defeated nationwide and the most notorious cases of electoral fraud will be investigated first. Therefore, elites of genuinely pro-incumbent regions have few incentives for perpetrating fraud: they will less likely be punished for “the lack of political solidarity” if the incumbent will stay in power and they do not need to incur excessive risks associated with fraud if the challenger will win. To the contrary, elites of the less supportive regions have more incentives to orchestrate fraud in order to evade punishment by the incumbent for the failure to demonstrate massive electoral support for autocracy. Thus, if regional elites are primarily motivated by perceived potential costs of fraud associated with the level of the incumbent’s genuine popularity, in the cross-regional context, theoretical expectations should be opposite to those presented by Rundlett and Svolik (2016).

Second, this does not mean, however, that the relationship between the sincere incumbent’s vote and the level of fraud exists, even though this relationship is negative, because other factors extending beyond the risk assessment do also determine electoral fraud. As the following analysis in Chapter 5 and 6 shows, electoral fraud is interrelated with distributive politics. In order to stay in power, the central-level incumbents strive to secure loyalty of regional elites and instigate them to implement various authoritarian policies, including electoral fraud, by allocating larger central transfers to regions with higher levels of the incumbent’s vote. Regional elites, thereby, are materially interested in larger vote rates for the incumbent and they seek to perpetrate fraud (as a simplest “booster” of the vote) due to this material incentive.

Third, the degree of freedom of local agents is largely exaggerated in Rundlett and Svolik’s model. Authoritarian leaders can exercise control over their agents in several ways. They can decrease funding, transfers, and the flow of other favors; they can remove disobedient agents from office; inspire criminal litigations; and resort to blackmail or assassination if the prior tools appear to be ineffective. Therefore, local agents cannot deliberately undersupply or oversupply fraud completely at their own discretion.

Thus, the assumption, which underlies the idea of the adjustment for the QR estimate, that the initial, authentic or sincere incumbent’s vote does not correlate with the level of fraud is realistic. Consequently, if the QR estimate does not correlate with the measures of fraud, the estimate is correct. The presence of correlation implies that the estimate has lost its precision under the influence of fraud and should be adjusted.

Table 4.3 displays the relationship between the QR estimate, the four measures of fraud, the regression quantile (tau), turnout, and several interaction effects. It should be mentioned that observations of the 4th cluster are excluded from the model. For the purpose of creating of the adjustment for the QR estimate, there is no need to interpret each individual coefficient, especially inasmuch as the model includes multiple interaction terms. The rationale of including the interactions is to allow the effects of some variables to be different at various levels of other variables and to increase, thereby, the deterministic power of the model for the adjustment. The high significance levels of the interactions show that the main effects are indeed conditional on levels of other variables. The model has relatively high explanatory power (R^2 = 54.9%) indicating that the QR estimate tends to change under the influence of fraud.

Table 4.3. The best OLS interaction effects model of the QR estimate on four measures of fraud, regression quantile, and turnout; 2012

DV: QR Estimate	Coefficient	Std. Error	t-value
(Intercept)	.1085	.0427	2.54*
QR fraud [-4, 1]	.0875	.0116	7.57***
MADT [0, 0.15]	1.464	.4633	3.16**
MADR [0, 0.1]	5.409	.7676	7.05***
$\chi^2_{LBL\%}$ [0, 150]	-.0011	.0003	-4.10***
Tau	.0011	.0015	.77
Turnout	.6476	.0709	9.14***
QR fraud [-4, 1] × MADT [0, 0.15]	-.1262	.0546	-2.31*
QR fraud [-4, 1] × MADR [0, 0.1]	.1709	.1039	1.65
QR fraud [-4, 1] × Tau	-.0023	.0005	-5.14***
QR fraud [-4, 1] × Turnout	-.1295	.0139	-9.32***
MADT [0, 0.15] × MADR [0, 0.1]	-12.54	3.4320	-3.66***
MADT [0, 0.15] × Tau	.0580	.0182	3.19**
MADT [0, 0.15] × Turnout	-1.115	.7569	-1.47
MADR [0, 0.1] × Tau	.1151	.0319	3.61***
MADR [0, 0.1] × Turnout	-7.812	1.1050	-7.07***
R-squared	.5486		
N	1893		

Note: The model includes the same recoded variables that are used in the cluster analysis; their limits are indicated in squared parentheses. Observations of the 4th cluster have been excluded from the sample. The best model is selected by using a stepwise algorithm with “both” direction of search based on minimizing of Akaike's information criterion (AIC). Significance codes: *p < 0.05, **p < 0.01, ***p < 0.001.

Specifically, if all variables are fixed at their means of the 1st cluster, the model predicts QR estimate = 55.3%; the fitted values for the 2nd and the 3rd cluster are equal 60.4% and 66.4%, respectively. Hence, correct estimates of the 2nd cluster should be by 5.1% smaller and 3rd-cluster estimates should be by 11.1% smaller compared with the 1st cluster, on average. Thus, using the 1st cluster as a reference category (i.e., as a nearly no-fraud cluster), the adjustment for the QR estimate, A_i, can be formally defined as follows:

$$A_i = \begin{cases} 0.5525 - Fitted & if\ Cluster < 4 \\ N/A & if\ \ Cluster = 4' \end{cases}$$

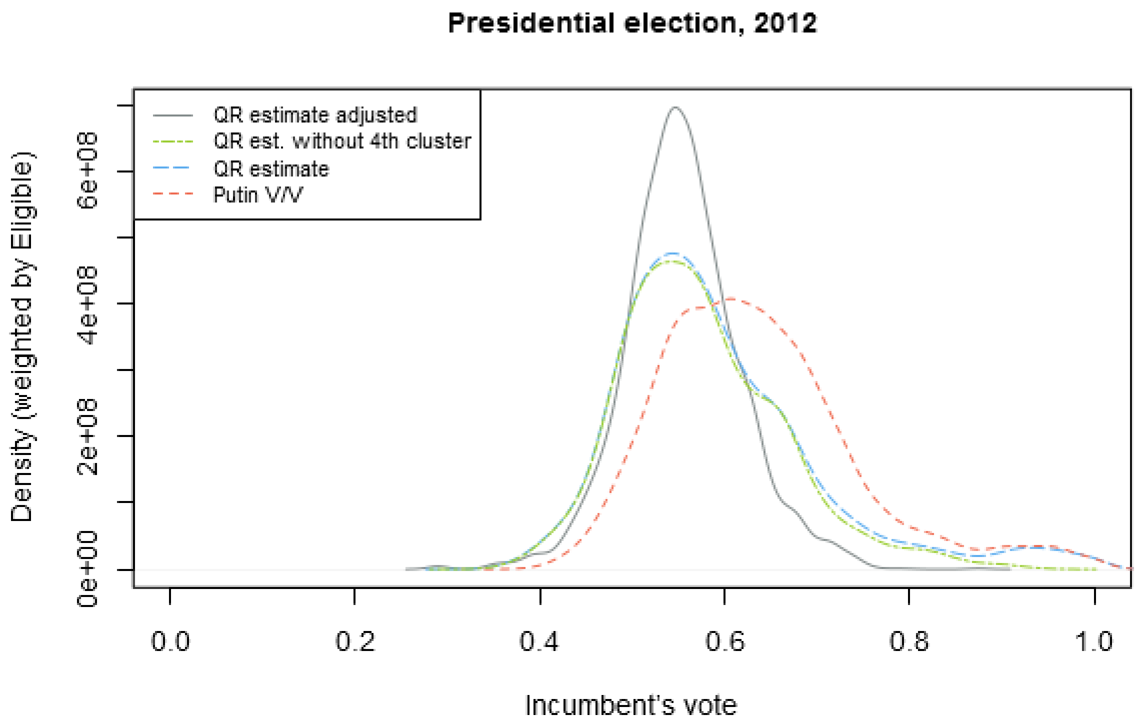
where *Fitted* refers to fitted values from the from the model in Table 4.3, 0.5525 is the mean fitted value of the 1st cluster, and N/A denotes a missing value.

Once this rule is applied, the average adjustment weighted by the number of eligible voters appears equal to -0.0321. The relationship between the QR estimate and the adjustment by cluster is compared between the presidential elections of 2000–2012 in Appendix D6. To demonstrate the difference between the adjusted and non-adjusted estimates, Figure 4.4 shows distributions of the both estimates and officially reported share of Putin’s votes. The difference between the official vote and vote estimates is obvious. Similarly to the results demonstrated by methods developed by Shpilkin (2011) and Klimek et al. (2012), the abnormally huge right tail of the official vote distribution is slightly “normalized” in the distribution of the QR estimate with the excluded 4th cluster. The difference in the distributions of QR estimates with and without the 4th cluster shows that the QR estimate becomes not sensitive to fraud at high values of the variables where electoral data are extremely distorted: the variables are beginning to diverge after Putin V_i^I/V_i exceeds the 85-percent threshold and the QR estimate with the 4th cluster fully converges with the official vote share after the 95-percent threshold. The difference determined by the 4th cluster is better visible in the non-weighted by the number of eligible voters distributions (see Appendix D7).

In this regard, the adjusted QR estimate performs much better. Its right tail as well as the left tail reflects the normal distribution with high accuracy.

Furthermore, while Shpilkin's and Klimek's methods assume that the left tail of the official vote distribution is not exposed to fraud and virtually treat the first local maximum as the mean of the candidate's vote share, Figure 4.4 shows that the first local maximums of all QR estimate distributions are substantively smaller than the first local maximum of the official vote distribution and that their left tails are generally distinct. The distributions of adjusted and non-adjusted estimates are distinct mainly in their right tails.

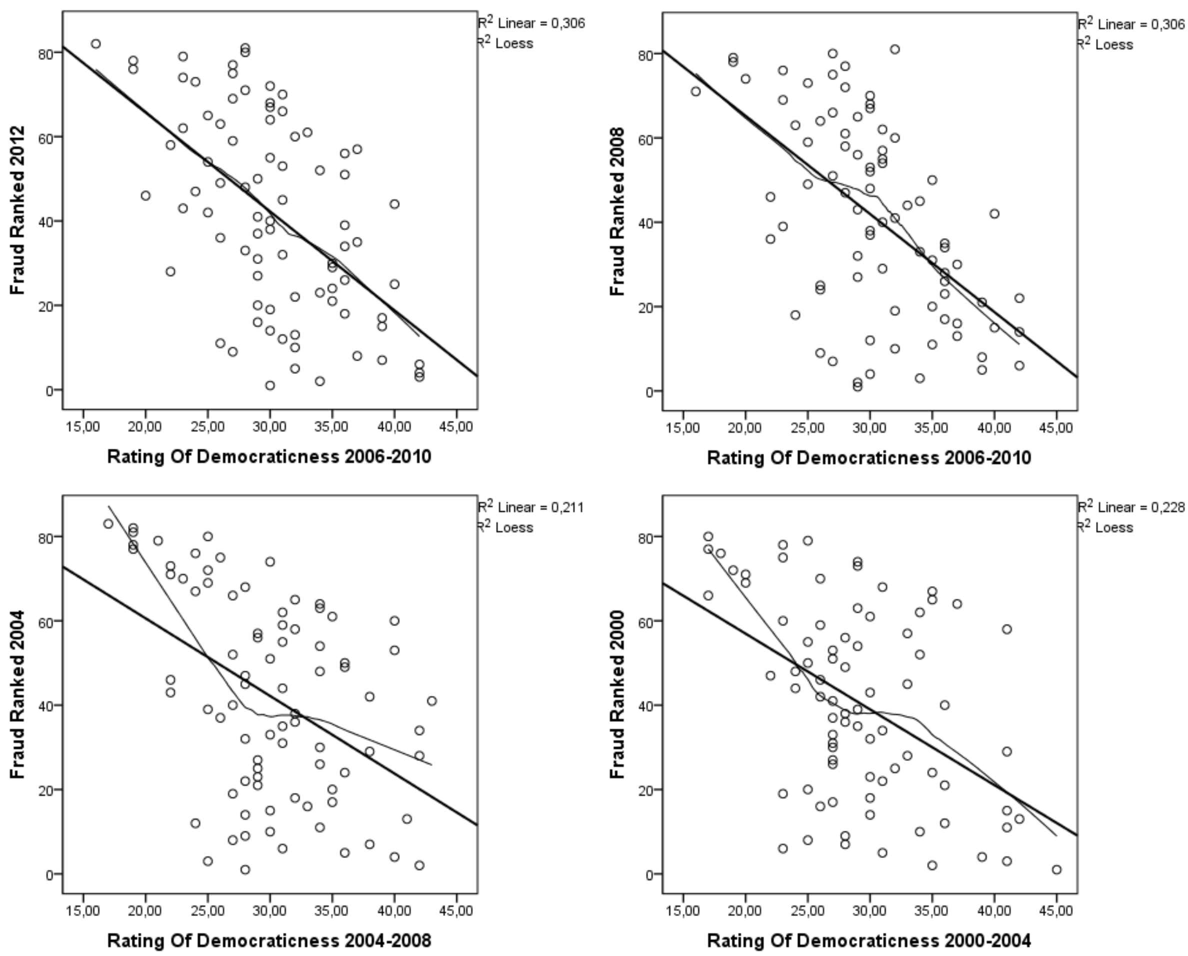
Figure 4.4. The distributions of Putin's QR-based estimates and the official vote share



Note: For the adjusted QR estimate and the QR estimate without the 4th cluster, non-weighted N = 1893, for both other distributions non-weighted N = 2047. N denotes the number of TIKs.

To summarize the results of the analysis of electoral fraud in the presidential election of 2012, Table D1 presents the regionally aggregated official incumbent's vote share, the adjusted QR estimate, all measures of fraud, and the incumbent's vote share taken from polling station protocols collected by electoral observers. The table generally suggests that the average adjusted QR estimate of Putin's vote share (55.5%) and the vote share reported by observers (51.5%) are smaller than the official share of the vote (64.4%). The largest regional differences between the electoral commission's tallies and observers' reports are observed in Tatarstan (17.0%), Primorsky Krai (15.9%), and Kemerovo Oblast (11.9%). The top list of regions with respect to the largest quantitative amount of fraud, with respect to the adjusted QR estimate, includes Yamalo-Nenets Autonomous Okrug (28.2%, the average cluster = 3.3), Dagestan (27.5%, cl. = 3.8), Tuva (27.1%, cl. = 3.0), Mordovia (25.0%, cl. = 3.4), Tatarstan (23.3%, cl. = 3.3), and Bashkortostan (19.2%, cl. = 2.9). Among the regions that have not been marred by electoral forgery, can be mentioned Moscow (-0.8%, cl. = 1.2), Vladimir Oblast (-0.7%, cl. = 1.2), Perm Krai (1.0%, cl. = 1.4), Sverdlovsk Oblast (2.1%, cl. = 1.3), Karelia (2.3%, cl. = 1.3), and Kostroma Oblast (2.4%, cl. = 1.3). The regional dimention of electoral fraud, thereby, demonstrates a wast variety of regions ranging from electoral democracies, in which electoral fraud is sporadic and quantitatively small, to closed authoritarian regimes, where electoral fraud is extreme and electoral competition is meaningless. Figure 4.5 displays the relationship between electoral fraud and the level of regional democracy for all election years from 2000 through 2012.

Figure 4.5. Electoral fraud and the level of regional democracy by election year



Note: The variable of electoral fraud (%) is ranked to provide linearity. The rating of the democratic quality of regions is developed by experts of the Moscow Carnegie Center (Petrov and Titkov 2013).

Although vote shares from observers' reports are similar to QR estimates (R^2 = 0.538), the former might be of less reliability. First, electoral observers' reports are biased in favor of the urban area, especially toward Moscow and Saint-Petersburg. The coverage in small towns or in the rural area is sporadic or absent. This bias sometimes reveals itself in smaller average vote shares of observers' reports compared with QR estimates. For instance, in Omsk Oblast and Primorky Krai (the regions with the largest discrepancy – 6.0% and 6.4%, respectively), all observers' reports came from their capital cities – Omsk and Vladivostok. However, if take the average QR estimate values of only those TIKs from which the reports have come, the difference in Putin's vote share between observer's data and the QR estimate becomes negligible – -1.0% in Omsk and 0.4% in Vladivostok. Second, the coverage by observers is also biased toward the regions with more competitive polities, accordingly, observers are under- or not represented in the regions with high levels of electoral fraud. Third, polling station protocols gathered by observers contain the artefacts of all types of fraud that occur during the processes of voting and vote count.

The proportion of TIKs in analysis (i.e., the quantity of available QR estimates in the region) tends to decrease with the level of electoral fraud measured as the average cluster, though the relationship is not strong (correlation = -0.465). For this reason, vote share estimates are not defined in three regions (the mean cluster = 4): Karachay-Cherkessia, Ingushetia, and Chechnya. The QR estimate is also undefined for Chukotka Autonomous Okrug, yet the region was not included into analysis since the number of UIKs within TIKs is smaller than 20. In four regions, the number of TIKs in analysis is one or two. In six regions, the number of TIKs in analysis is between three and five. On the whole, the adjusted QR estimate is available for 69% of all TIKs.

The Dynamics of Electoral Fraud in 2000–2012

In this section, I summarize the results of the analysis of electoral fraud for the presidential elections of 2000–2012. Table 4.4 reports descriptive statistics for the main variables in analysis. When Vladimir Putin first time took power in 2000, the official incumbent's vote share slightly exceeded fifty percent (0.534). Then it stabilized at the level of 71–72% in 2004–2008 and decreased to 64.4% in 2012 when the opposition has managed to arrange a large-scale electoral observation campaign followed by a raging wave of post-electoral protest.

Table 4.4. Descriptive statistics for the official incumbent's vote share, the adjusted QR estimate, and the measures of fraud by election year

Year	Cluster	Incumbent V_i^I/V_i	Adjusted QR Estimate	Difference (Fraud)[c]	QR Fraud	MADT	MADR	$\chi^2_{LBL\%}$	Cluster, μ
	1	.5638	.5464	.0174	-.0820	.0479	.0199	16.5	
	2	.6612	.5671	.0941	-.5360	.0779	.0414	11.6	
2012	3	.7439	.5763	.1676	-2.333	.0801	.0508	13.6	2.36/ 2.52[d]
	4	.9072	n.a.	n.a.	-2.164	.0262	.0184	60.0	
	Total[b]	.6435[a]	.5548	.0887	-.6744	.0628	.0322	19.3	1.88
	1	.6422	.6206	.0215	-.1048	.0431	.0161	24.7	
	2	.6866	.6289	.0578	-.4834	.0907	.0440	13.9	
2008	3	.7883	.6523	.1360	-2.6157	.0646	.0475	21.0	2.22/ 2.50[d]
	4	.9391	n.a.	n.a.	-3.7369	.0129	.0153	59.2	
	Total[b]	.7122[a]	.6324	.0798	-.8596	.0659	.0297	25.8	1.94
	1	.6824	.6387	.0437	-.0431	.0475	.0183	18.9	
	2	.6969	.6499	.0469	-.4130	.0965	.0485	13.5	
2004	3	.7748	.6577	.1171	-2.6157	.0673	.0509	24.2	2.22/ 2.43[d]
	4	.9678	n.a.	n.a.	-3.9096	.0155	.0114	73.1	
	Total[b]	.7192[a]	.6443	.0749	-.6054	.0654	.0294	24.4	1.75
	1	.4992	.4619	.0373	.0340	.0455	.0192	16.8	
	2	.5227	.4727	.0500	-.0032	.0809	.0606	10.5	
2000	3	.5772	.4834	.0939	-.7129	.0810	.0688	15.0	2.60/ 2.85[d]
	4	.7836	n.a.	n.a.	-4.2087	.0626	.0658	15.3	
	Total[b]	.5340[a]	.4733	.0607	-.2176	.0604	.0368	16.0	1.68

Note: a. The official vote share is calculated as the ratio of summed incumbent's votes to summed valid votes. b. Entries in the row, except Incumbent V_i^I/V_i, are the means calculated with weighting cases by the number of eligible voters. Other statistics are simple means. c. Denotes the difference between Incumbent V_i^I/V_i and Adjusted QR Estimate. d. Entries indicate the mean cluster weighted by MADT or / MADR calculated by the following formula (for MADR analogously): $\mu_{MADT} = \sum_1^4(1MADT + 2MADT + 3MADT + 4MADT)/\sum_1^4 MADT$. QR fraud, MADT, MADR, and $\chi^2_{LBL\%}$ are limited variables. See Table 4.2, D5, D7, and D9 for details. Significance levels for $\chi^2_{LBL\%}$: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$.

Our qualitative measures of fraud indicate a slightly different but still similar picture: electoral fraud proliferated from 2000 to 2008 and in 2012 it returned to its intermediate level of 2004–2008. This trend is, first of all, depicted by the mean election-specific cluster – an indicator that summarizes all four qualitative measures of fraud. Its minimal values of 2000 (1.68) has never been even approximately repeated in future. Although the official share of the vote established at the constant level in 2004 and 2008, the mean cluster shows that electoral fraud has become more widespread from 2004 (1.75) to 2008 (1.94). It means that the genuine level of incumbent support began to decline in 2008 when the authoritarian regime was seemingly at the apex of its strength and nothing foreshadowed the electoral slump of 2012. The opportunities for perpetrating fraud have become less favorable in 2012 due to the electoral observation campaign. We do not know whether the interested actors made more, less or same effort for perpetrating fraud in 2012[83] but the mean cluster (1.88) indicates that, due to or contrary to the elite's effort, the extent of electoral fraud diminished in the election.

The amount of electoral fraud is estimated in more explicit unites of measurement by QR fraud. The indicator shows that 21.7% of polling stations were exposed to fraud commensurable to ballot stuffing in 2000. This considerable proportion has nearly tripled in 2004 (60.5%) then reached its maximum of 86.0% in 2008 and rolled back to 67.4% in 2012. This shift from considerable and more than sporadic to widespread electoral fraud corresponds to the transformation of the political regime from a nascent electoral autocracy where opposition candidates are disadvantaged but can challenge the incumbent effectively to a nearly hegemonic authoritarianism, in which the opposition has only the "right of whisper" during electoral campaigns and especially between them.

The average chi-squared statistic is consistent with the general temporal pattern of fraud. It is marginally significant at $p = 0.067$ in 2000, highly significant in 2004 and 2008 ($p = 0.0037$ and $p = 0.0022$, respectively), and less significant in 2012 ($p = 0.023$). The average values of MADT and MADR are very similar between elections, yet they do not have such straightforward interpretation. The indicators tend to gradually enlarge with the amount of fraud determined by ballot stuffing and miscounting of candidates' votes, yet after some tipping point they tent to shrink inasmuch as at its extreme levels fraud takes the form of rewriting of polling station protocols and reporting of absolutely fictitious numbers of votes. If fraudsters act independently of each other (at the level of UIK) and they do not have "recommendations" from their superiors regarding the "preferable" election result,

[83] They could probably try to make more effort since the decline in public support was evident from the results of the State Duma election of 2011. On the other hand, an excessive blatant fraud could reinforce the popular protest that emerged after the parliamentary election. For this reason, authoritarian leaders were more interested in perpetrating fraud at the margin.

they augment incumbent's and valid votes randomly that results in huge standard deviations of turnout and the vote share observed in the 2nd and 3rd cluster. If fraudsters act at the level of TIK and consequently have more discretion over electoral data of many polling stations simultaneously, they typically "recode" vote shares of all polling stations in almost a single value of in a very narrow range of values (i.e., types of fraud named "in a line" and "in a dot"). As a result, observations with unnaturally small deviations of turnout and the vote share are included in the 4th cluster.

To find the tipping point at which MADT or MADR finishes to increase and begins to decline, I use the mean cluster weighted by MADT / MADR, which is presented in Table 4.4. If the distribution of MADT or MADR is normal or uniform, the mean cluster equals 2.5. Skewness in the distribution by cluster shifts it upward or downward. The smaller the value of the tipping point, the sooner (i.e., closer to the 1st cluster) comes the threshold of turning to extreme fraud. The tipping points of MADT / MADR (2.6 / 2.85) are farthest from the center of 2.5 toward the 4th cluster in the election of 2000. Furthermore, the average values of MADT and MADR in the 4th cluster do not demonstrate such contrasting decline as they do in other election years; these values rather approximate to the average values of the 3rd cluster between the subsequent elections. The tipping points in the election of 2004 (2.22/2.43) are similar to the tipping points in the election of 2008 (2.22/2.50) and both, especially the means of MADT, are located below the center. The means in the election of 2012 are slightly higher 2.36/2.52. From these facts, we cannot make a clear distinction between elections of 2004 and 2008 regarding the level of electoral fraud, yet it is certain that the election of 2000 is less fraudulent than all other elections and that the election of 2012 is slightly less fraudulent than elections of 2004 and 2008.

As we turn to quantitative estimates of fraud by election years, the temporal pattern of fraud revealed by the qualitative measures of fraud seems distorted. The estimated amount of fraud as the difference between the official incumbent's vote share and the adjusted QR estimate is equal to 6.1% in 2000, 7.5% in 2004, 8.0% in 2008, and 8.9% in 2012. However, this result should be interpreted cautiously. First, as Appendix D6 show, the average size of the adjustment is not constant between elections. It is equal, respectively, to 1.2%, 1.7%, 1.6% and 3.2% in 2000–

2012.[84] If the average adjustment had been constant between elections, the temporal pattern of fraud indicated by the adjusted QR estimate would have been similar to that indicated by the four qualitative measures of fraud. Second, models presented in Table 4.3, D6, D8, and D10 show that the QR estimate varies markedly under the influence of variables associated with fraud. The adjustment for the QR estimate built upon these models takes this relationship into account. However, such adjustment is absent at the national level. So long as types and the scope of fraud vary between elections, election-averaged QR estimates are biased differently and cannot be simply comparable at the national level. Nevertheless, the nation-level vote share estimates are of minor interest in the current research. The study is primarily focused on region-level vote share estimates that can be used in the subsequent cross-sectional analysis. In this connection, the adjusted QR estimate can be deemed unbiased at the regional level since the adjustment corrects its deviations determined by fraud.

However, the quantitative amount of fraud between elections can be estimated regardless of the bias in the QR estimate at the national level. For this purpose, the adjusted QR estimate is regressed on the official incumbent's vote share. The level of similarity between variables is indicated by the following R-squared statistic from 2000 to 2012: 84.0%, 65.1%, 25.6%, and 55.1%. It appears that the variables are the most similar in 2000. Then the level of similarity decreases sharply to the election of 2008 and it almost returns to the level of 2004 in 2012. The statistic for the election year of 2008 seems exaggerated since it follows that the official vote share consists of fraud by nearly seventy five percent. In fact, this result turns out to be primarily due to extremely high values of the incumbent's vote. If both variables are ranked to neutralize the effect of outliers, R-squared statistic looks more feasible but it still repeats the temporal pattern of electoral fraud from 2000 to 2012: 87.0%, 80.4%, 43.2%, and 72.0%. Thus, both qualitative and quantitative

[84] It follows from Figure D7 that the discrepancy between zero and the mean of the adjustment is determined by two factors – the amount of fraud, the amount of fraud in the 1st cluster, and the interaction between them. If the amount of fraud is small (generally and in the 1st cluster), as in the election of 2000, the mean is close to zero. If the general amount of fraud is large but observations of the 1st cluster are not exposed to fraud, as in the election of 2012, the difference between zero and the mean is large. In this case, the difference between the mean of fitted values and the mean of fitted values in the 1st cluster is greatest and the adjustment calculated as the mean fitted value of the 1st cluster subtracted by fitted values appears to be negative. If the amount of fraud is large and observations of the 1st cluster are affected by fraud, as in the elections of 2004 and 2008, the mean of fitted values and the mean of fitted values in the 1st cluster do not differ much and the mean adjustment tends to be small. A larger or smaller mean of the adjustment does not have a substantial impact on the QR estimate at the regional level (all estimates become uniformly smaller or larger when the adjustment is applied). However, a problem appears at the national level when different adjustments with different means are applied between elections hindering, thereby, year-to-year comparison.

measures of fraud are congruent. They consistently indicate that electoral fraud proliferated in the Russian presidential elections from 2000 to 2008 and then decreased to an intermediate level of 2004–2008 in 2012.

Conclusion

This chapter has examined the amount of fraud in the Russian presidential elections of 2000–2012. For this purpose, the theoretical findings of Chapter 2 and 3 have been formalized to develop a new approach to electoral fraud forensics. The novelty of the approach is a separation of the estimation procedure into two parts. Firstly, the initial (i.e., not affected by fraud) share of a candidate's vote is estimated based on quantile regression parameter estimates. Then, to account for the reliability of the obtained QR estimate conditionally on the degree of distortion of electoral data, I use four qualitative measures of electoral fraud. QR fraud gauges the deviation from the theoretically predicted relationship between turnout and the absolute vote share. MADT and MADR are designed to tap anomalously large and small distributions of turnout and vote share that result from various types of vote rigging. And chi-squared statistic for the deviation of the last-digit frequencies in the candidate's vote share from Benford's law ($\chi^2_{\mathrm{LBL\%}}$) detects anomalies in the last-digit frequencies resulted from human bias if electoral data have been manipulated.

The qualitative measures of electoral fraud are used in cluster analysis to group electoral data of the Russian presidential elections of 2000-2012 into four clusters depending on the extent and types of fraud. Most cases have been defined in clusters of moderate fraud. The 4$^{\text{th}}$ cluster appeared to be the most distinct one (i.e., having the least mixing probabilities) in all elections throughout the period of study. Observations of this cluster are characterized by excessively high incumbent's vote shares and turnout rates (90.0% and 93.3% on average between elections, respectively), and by extreme values of all qualitative variables of fraud. For this reason, observations of this cluster have been excluded from further analysis.

The difference between the QR estimate and the official share of the incumbent's vote togeather with interaction effects models have shown that, as expected, the QR estimate varies under the influence of electoral fraud. The estimate is close to the level of the official vote share in the 1$^{\text{st}}$ cluster where the amount of fraud is minimal, then it its average values are smaller than the official vote share but still higher than the level of the 1st cluster, and the QR estimate converges with the official vote share in the 4th cluster. The adjustment developed for the QR estimate takes this variability into account by detrending the QR estimate of correlation with the qualitative variables of fraud and two auxiliary variables – turnout and regression quantile. As a result, the adjusted QR estimate's difference between the means of the 3rd and the 1st clusters decreased to 2.6% compared with the difference of the non-adjusted estimate (7.8%) – on average between elections. And this difference is greatest in highly fraudulent elections of 2008 and 2012, respectively: 3.2% and 3.0% for the adjusted QR estimate and 10.9% and 14.1% for the non-adjusted QR estimate. Put differently, the adjustment allows to efficiently correct the QR estimate when high values of electoral fraud entail its bias.

The adjustment, however is not applied at the aggregated level (i.e., between elections), therefore, election-specific estimates of the incumbent's vote are not fully comparable. Notwithstanding, the strength of relationship between the official incumbent's vote share and the adjusted QR estimate (measured as R-squared statistic), consistently with the qualitative measures of fraud, indicate that the amount of fraud has been the least in the presidential election of 2000. Then the scale of electoral forgery has grown and reached its maximum in the election of 2008. In 2012, the amount of fraud declined as a result of the electoral observation campaign and the post-electoral protest triggered by mass public awareness of fraud after the parliamentary election of 2011.

In quantitative terms, even though these results should be interpreted cautiously, the analysis has shown that the incumbent has derived a benefit of fraud of 7.6% of the vote, on average between elections. This amount has hardly exceeded a 10-percent threshold in any particular election. However, it should not be disregarded that the scope of fraud varies greatly by region and it is much larger in several regions. In particular, the average amount of fraud between 2000 and 2012 is estimated as high as 22.2% in Dagestan, 22.1% in Mordovia, and 18.2% in Tatarstan, whereas the minimal rates of fraud are estimated in Vladimir Oblast, Kostroma Oblast, and Perm Krai: 1.7%, 2.5%, and 3.0%, respectively. It is also worth mentioning that, qualitatively, even the maximal levels of fraud in regions like Dagestan do not create a complete picture. In practice, not only share of the vote but turnout is also manipulated. As a result, the number of fictitious votes can be commensurable with the number of authentic votes.[85]

Furthermore, our qualitative measures of fraud allow to look at the picture from a different angle. QR fraud indicates that, on average between elections, 58.9% of all polling stations have experienced a falsification analogous to ballot stuffing. In 18.7% of observations grouped in the 3rd cluster, fraud has been not limited to counting non-voters as incumbent's voters but a multitude of opposition's votes were also counted as incumbent's votes (QR fraud = 2.1). In this cluster, MADT is 1.6 times larger than MADT in the 1st cluster and MADR 3.0 times exceeds the level of the 1st cluster. In other words, under the influence of fraud, observations in the 3rd cluster are 1.6 times more scattered on X axis and 3.0 times more scattered on Y axis compared with the 1st cluster – the cluster of rare occurrences of fraud. Finally, in 7.5% of observations grouped in the 4th cluster, electoral data are completely artificial.

Jointly, electoral fraud in the Russian presidential elections 2000–2012 has played a typical role that is ascribed to fraud in electoral authoritarian regimes. It was not outcome-changing as occurs in closed authoritarian regimes and it was not sporadic as in electoral democracies but it was rather employed as a primary tool for creating a sense of incumbent invincibility. In fact, Vladimir Putin and his successor Dmitry Medvedev would have won without resorting to fraud. Why is then electoral fraud so pervasive intrinsic and inextricable element of the Russian presidential elections? And is there any reason for fraud besides creating the image of strength or invincibility for authoritarian leaders?

The answer to the first question probably lies in the results of the election of 2000 – the time of nascence of authoritarianism when the media was not so restricted, repression of the opposition was not so harsh and other authoritarian incumbency advantages, including electoral fraud, were not as obvious as they turned out to be in future. Vladimir Putin has officially gained 52.9% of the vote. The official vote share in the 1st cluster is equal to 49.9% and the estimated vote share in the election is equal to 47.3%. The latter two results are hardly acceptable

[85] Consider, for instance, a polling station at which the number of eligible votes is equal to 1000, the number of genuine valid votes = 600 (i.e., turnout = 60%), and the number of genuine incumbent's votes = 360 (the incumbent's vote share = 60%). If turnout is artificially inflated by 20%, then the number of valid votes increases to 800. If the incumbent's vote share is also increased by 20% then the number of incumbent's votes = 640 (i.e., 80% of the inflated valid votes). Thus, if turnout and the share of the vote are both fraudulently enlarged by 20%, the number of fictitious votes (640 – 360 = 280) amounts to 78% relatively to the number of genuine votes (360). And this proportion increases as the genuine vote share and turnout are getting smaller.

from the point of view of electoral authoritarianism since the absence of a majority of the vote, according to the electoral code, entails a second round of the election and, accordingly, a more equal (too equal for electoral authoritarianism) competition between candidates. Simply speaking, if authoritarian incumbents refrain from using their hyper-incumbency advantages, they will lose elections. This cannot happen instantly if the level of popular support is high but the electoral failure of the incumbency will unavoidably occur later, especially in times of economic and political crises. Authoritarian institutions, as any institutions, have their own logic and inertia. Therefore, authoritarian leaders cannot "switch" them off in good times and resume their functioning when popular support will have decreased.

Furthermore, as I show in Chapter 5 and 6, electoral fraud is interdependent with distributive politics. Authoritarian leaders distribute central transfers and other valuable resources to their local agents (or regional elites who are responsible for perpetrating fraud) on the basis of political loyalty. Namely, regional elites are mainly required to refrain from challenging the incumbent, suppress various forms of the opposition that can be hazardous to the regime, and demonstrate high electoral results for the incumbent in their regions, that is, implement various authoritarian policies. However, the system of authoritarian exchanges is built so that regional elites can derive benefits from their offices primarily by supplying central autocrats with the required authoritarian policy outcomes, including electoral fraud. Consequently, authoritarian incumbents cannot cease authoritarian practices without losing elite loyalty followed by a system-wide disintegration of authoritarianism.

A possible answer to the second question is partly interrelated with the answer to the first one. Authoritarian leaders may in fact use electoral fraud to convey a message to the opposition, elites and voters that the incumbent is genuinely popular or that he possesses sufficient resources to pay for loyalty and to repress dissenters. However, this is done exactly for the same reason for which authoritarian leaders do intrinsically not tolerate a fair electoral competition – they apprehend that they will lose elections. The cost of losing *authoritarian* elections is a crucial determinant of inevitability of fraud under authoritarianism. More precisely, costs of electoral failure under authoritarianism are much higher than under democratic rule due to the ubiquitous prevalence of informal institutions that tie actors by illegal practices and, thereby, make their income, property, and official status conditional on maintaining the political hegemony. In order to win elections, authoritarian leaders resort to various illegal forms of "doping", such as fraud and repression, and build up a system of authoritarian institutions that supplies cadres, resources, and informal rules for "doping". Achieving an electoral victory through such illegal means, they, however, dramatically raise costs of electoral (and non-electoral) failure.[86] For fear of criminal prosecution, they seek to stay in power at any cost and by any means. These means ordinarily imply more fraud and repression. This self-reinforcing logic of authoritarianism sometimes continues to have an effect when authoritarian leaders rig elections even without an obvious necessity for fraud.

[86] Goemans (2000: 569) shows that when dictators lose wars moderately, they more likely remain in office (in 63% of cases) than their democratic counterparts (in 14% of cases). At the same time, 83% of dictators, who lost power after moderately losing a war, were eventually punished in the form of exile, imprisonment or death, whereas only 33% of democratic leaders were punished, accordingly.

Chapter 5. The Distributive Game: Politically Motivated Allocation of the Federal Transfers in Russia

Introduction

Numerous studies assert that authoritarian leaders routinely abuse state resources to reward loyal supporters or to appease contesting elites (Greene 2006; Kitschelt and Wilkinson 2007; Levitsky and Way 2010; Magaloni 2006; Schedler 2006). There is a consensus in the literature that private goods are more targetable than public goods and *ipso facto* are more appropriate for clientelist politics. Nevertheless, central transfers to subordinate levels of government represent an example of public and formally legal distribution that challenges this assertion. Although it is impossible in practice to politically target public hospitals, schools, roads and other public goods at particular voters, transfers allow manipulating with the average regional levels of the available public goods, thereby, making the distribution targetable by nature.

This chapter examines the determinants of the allocation of federal grants to regional budgets in Russia to test whether the interbudgetary payments are used as a politically neutral tool with welfare equalizing goals or pursue various political aims of self-interested actors. Using panel data multilevel modeling it shows that, along with equity and efficiency considerations, electoral interests played a considerable role in distributive politics under Putin's rule in the period from 2000 to 2012.

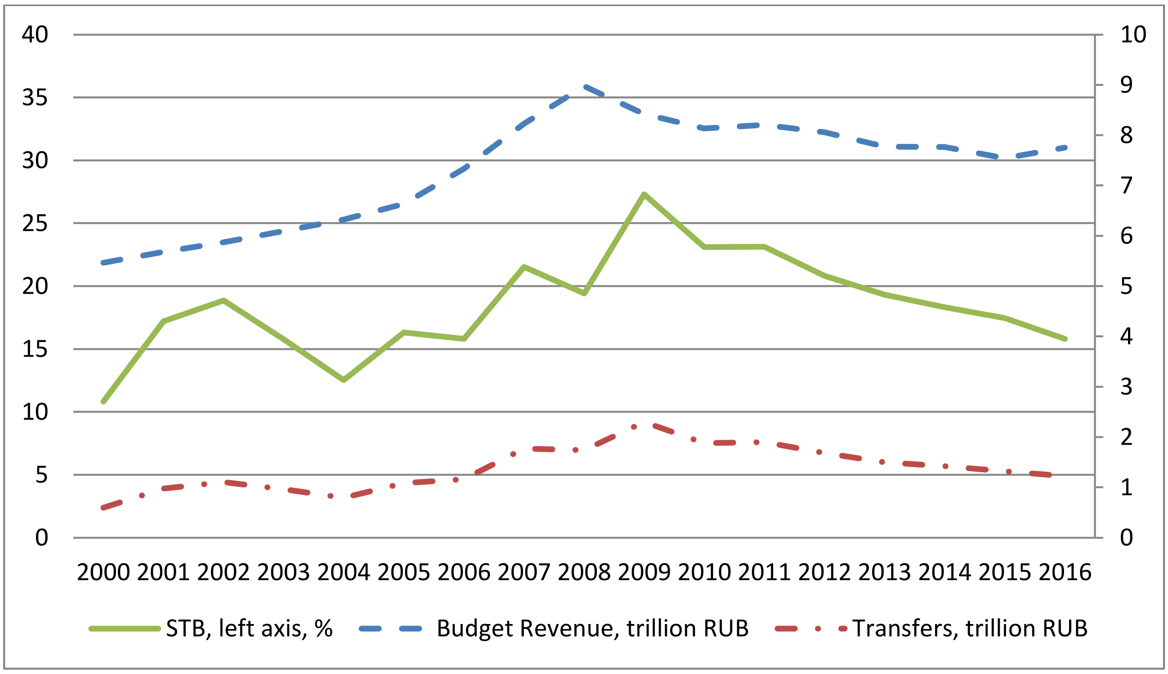
Russia's regional finances are considerably dependent on federal transfers. On average, 16.8% of the total regional budget revenues consisted of the federal remittances in the period of 2000–2012. The dependence of regional budgets on the central payments is larger if it is measured as the ratio of federal transfers to taxes levied by regional budgets: transfers amounted to 22.3% of the average regional fiscal capacity.[87] The numbers, however, look larger from the elite perspective. If the national averages were not considered but the median values of the regional ratios (non-weighted by population medians) were calculated, the median governor between 2000 and 2012 had to deal with a budget that was at 25.7% funded from

[87] Population-weighted means that are equivalent to ratios of the nation-total sums of money are reported.

the federal center and the federal remittances amounted to 36.6% relative to tax revenues of the median regional budget.[88]

As it appears in Figure 5.1, the history of Russian regional finances is strictly divided during the period under study: before 2008 and after. The total regional budget revenue grew from 2000 to 2008. The total amount of the federal transfers as well as the share of transfers in the budget (STB), except for the years 2001 and 2002, increased more or less proportionally with the regional budget revenue in the period. After the Great Recession hit Russia in 2008 the growth of total revenue was replaced with a cutback and up to 2016 the situation nearly returned to the starting point. The economic crisis affected transfers to a greater extent than it did to total revenue. After a one-year lag, the share of transfers in regional budgets decreased from 27 percent at the apex in 2009 to 16 percent in 2016. Based on the graph we cannot conclude, however, that electoral concerns played any role in distribution of the overall sums of transfer money. No clear pattern appears before, after, or during the election years 2000, 2004, 2008, and 2012.

Figure 5.1. Regional budget revenues and transfers over time



Note: STB denotes the share of transfers in the budget. Budget revenues and transfers are inflation-adjusted country totals in constant prices of 2012.

[88] The discrepancy between weighted and non-weighted means comes from the fact that smaller regions receive larger transfers than their more populous counterparts.

The spatial variation of transfers has remained markedly large throughout the history of fiscal federalism in Russia. It has been pointed out that Dagestan received seventy times as much per capita in central subventions in 1992 as neighboring Stavropolsky Krai (Treisman 1996). Twenty years later in the election year 2012 the minimal value of central remittances (measured as the share of total transfers in the regional budget) was observed in the largest oil-producing region, Khanty-Mansi Autonomous Okrug (5%), while the maximal value (86%) was recorded in Ingushetia, a Caucasian region with a very modest industrial output. However, it remains unclear why a middle-income central-Russian region having 255,297 rubles (RUB) of gross regional product (GRP) per capita – Yaroslavl Oblast – received a nearly five times smaller amount of transfers relatively to its budget (15%) than Dagestan (72%), whose GRP per capita was only two times smaller (128,639.7 RUB); and why the largest Russian diamond producer Sakha (Yakutia) Republic received nearly three times more transfers (42%) than Komi Republic (15%) given roughly equal regional per capita income (565,449.8 RUB and 543,089.8 RUB, respectively).[89]

The literature diverges in explaining the reasons for such variation. In his pioneering study Treisman (1996) found that the federal transfers were distributed in accordance with bargaining power of regions, namely, a region's declaration of sovereignty by 1991 and the number of man-days lost to strikes were conducive to receiving larger central remittances while Yeltsin's vote in 1991 was negatively associated with the transfers. The negative relationship between the electoral objectives and the federal payments has been also confirmed in later studies (Treisman 1998a, 1998b, 1999). McAuley (1997) challenged Treisman's findings by arguing that the level of federal support for regions can be largely explained by indicators of social need. However, he did not control for political variables in analysis. Popov (2004), using a different model specification than Treisman, found that the share of Yeltsin's vote in 1991 was positively linked with per capita transfers in 1992 and 1993; the vote for democratic parties in 1999 had a positive and a negative relationship with the transfers in 2000 and 2001, respectively (both significant); the associations for other election years were negative.

More recent studies on the politics of federal transfers in the 2000s are also in disaccord over determinants of the federal spending. Contrary to Popov's mixed results and Treisman's findings, Jarocińska (2010) shows that the vote for the pro-

[89] The average annual exchange rate in 2012 was 31.1 rubles per one U.S. dollar.

incumbent party or presidential candidate is significant and positive predictor of transfers in the fixed effects model for the years 1995–1999, as well as in the model for the year 1997. Nevertheless, none of political variables appeared to be sufficiently significant in the models of years 2000 and 2000–2004. Marques, Yakovlev and Nazrullaeva (2016) argue that national level politicians may allocate money to both types of regions – most supportive (core) and those in which electoral competition is tough (swing) – based on the level of regional economic growth: in core regions, central politicians compensate slow growth by increasing transfers and withdraw funds in times when the economies experience faster growth; in swing regions, transfers are increased in times of economic growth and decreased in times of decline. However, as it will be shown later, the results of their analysis are crucially dependent on at least two outliers – Chukotka Autonomous Okrug and Magadan Oblast. Sharafutdinova and Turovsky (2017) assert that the lobbying capacity of governors along with their administrative capacity in delivering the vote for United Russia and mobilizing voter turnout play decisive role in contests over federal transfers. Analyzing the allocation of transfers in 2002–2012, they show that the number of official federal visits to the regions and voter turnout allow to attract larger transfers.[90] The relationship between federal officials' visits to the regions and regional administrative capacity is unclear though. Why do federal officials visit specific regions and neglect the others? And what does motivate federal officials to grant money to the visited regions (alternatively, they could penalize governors for poor performance on an investigated affair)?[91]

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[90] These effects are, however, small. If the number of federal visits increases by 4 standard deviations, the share of politically sensitive transfers (PST) in the budget enlarges by 2.0%; an increase from the minimum (0) to the maximum (18) yields 3.6% (in all models in Table 1). An increase by 4 standard deviations in voter turnout translates into 4.8-percent increase in the share of PST (in Model 3). The moderate levels of significance of these variables (at $p < 0.05$ and $p < 0.1$, respectively) primarily come from relatively large number of observations (880). Besides this, the variable of the number of federal officials' visits raises concerns about skewness of its distribution since a downward shift by 1.98 standard deviations (1.98 × 2.55) relatively to the mean (2.13) produces negative values that should not occur with zero/positive variables if the distribution is normal.

[91] The authors decline the interpretation of the vote for the party of power and turnout as proxies for regional political loyalty and support for the Kremlin. Instead they argue that these are indicators of regional administrative capacity to mobilize voters (electoral fraud via exerting pressure on voters in my terminology). "[S]uch mobilization requires a concerted effort by the regional administrative team – the same team that is likely responsible for preparing all the ground and paperwork required in the process of competing for federal grants and subsidies" (p. 171). In other words, regional elites exert pressure on federal officials in a similar way as they exert it on voters. Hence, the federal officials' visits and voter turnout or the incumbent's vote are two independent measures of bargaining power of regions. In this dissertation, I argue that such unilateral ultimatum-like bargaining by regions has become inadmissible in Putin's era when the Kremlin initiated the process of political recentralization. In these settings, federal transfers are distributed based on loyalty of regional elites to the regimes indicated by the vote for federal incumbents. Visits of federal officials to the regions play rather an auxiliary role (to negotiate details but bot principles of allocation of transfers).

This chapter continues this discussion by exploring the data on federal transfers in the period from 2000 through 2016. It shows that, controlling for alternative explanations, electoral interests played statistically and substantially significant role in determining the allocation of the federal transfers to regions. More specifically, transfer politics benefited the core constituency that was more supportive of the federal presidential incumbents, whereas the incumbent's core constituency appers to be predominantly comprised of the "ethnic regions", that is, regions with large proportions on non-Russian and non-Christian Orthodox population. Other variables associated with political objectives such as the governor's tenure in office and the number of United Russia representatives in the State Duma demonstrated weak or inconsistent effects on transfers.

The chapter is structured as follows. The next section discusses the main theoretical approaches in the literature to the allocation of intergovernmental transfers. After that follows the description of variables, data sources, and hypotheses of the study. The analysis begins with exploratory OLS regression models for year 2013 and after examining basic relationships and possible obstacles to a panel data model it proceeds with multilevel models that take the effects of year and budget type into account. The models of changes in transfers and causality issues are considered afterwards. The penultimate section examines the role of ethnic regions in forging the incumbent's clientelist coalition by the means of federal transfers. Lastly, the findings of this chapter are summarized in the conclusion.

Theoretical Approaches to Allocation of Intergovernmental Transfers

The literature on the distribution of intergovernmental transfers can be roughly divided into five groups.[92]

Normative Theory

Normative theory (Buchanan 1950; Oates 1972) stresses the principles of equity and efficiency in allocation of central receipts to lower-level areas. The equity

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Empirically, this logic implies an interaction effect between the number of federal officials' visits and the incumbent's vote. However, I do not examine this effect in the main analysis due to small explanatory power of the variable of visits in Sharafutdinova and Turovsky's model.

[92] I classify the literature by relying on the most relevant findings, though alternative explanations may be controlled for and results may be mixed.

principle is construed as necessity to compensate for inter-regional disparities in fiscal capacity, thereby guaranteeing more equal access to public services across regions. In other words, "[a]n intergovernmental transfer system can be worked out which would allow state units originally unequal in fiscal capacity to provide equal services at equal rates of taxation" (Buchanan 1950: 586). The efficiency principle, in its turn, implies creating a more level playing field for interjurisdictional competition to promote economic growth in economically disadvantaged areas (Oates 1999: 1128).

These idealistic prescriptions are, however, not always fulfilled in practice. Wright (1974) analyzed New Deal spending and found that per capita outlays were positively correlated with the Democratic percentage of the presidential vote, the standard deviation of the vote, and the index of political productivity. Later on, Wallis (1996) revisited New Deal spending. The pooled data and exclusion of Nevada from analysis appeared to crucially impact the results. Nevertheless, the standard deviation of the vote remained significant in all models. Extension of the period of study up to 1982 muted the effects of political variables but the relationship of the real per capita local and state expenditures with per capita grants turned out to be unexpectedly positive.

The positive effect of the Democratic presidential vote together with turnout on distribution of federal assistance programs was also detected for the period 1984–1990 (Levitt and Snyder 1995). Martin (2003) shows that turnout in House or Senate elections better explains bi-annual changes in per capita federal grant expenditures than the incumbent's vote share or the competitiveness of elections. Ansolabehere and Snyder (2006) used county-level data from 1957 to 1997. They found that counties with the highest vote share for the ruling party receive larger transfers, while the alternation of parties in power shifts the distribution toward supporters of the new party, and that increased spending in a county increases turnout in subsequent elections. A positive association between election returns and centrally allocated funds was also discovered in Argentina (Calvo and Murillo 2004), Argentina, Brazil, and Columbia (González and Mamone 2015), and Turkey (Luca and Rodríguez-Pose 2015).

Conversely, studying the distribution of appropriations bills of fiscal year 2008, transportation reauthorization (1998) and academic earmarked grants (1993–2000) Lazarus (2009) demonstrates that constituencies with a smaller share of the majority party vote in the U.S House of Representatives received more spending.

Thereby, Lazarus argues, the majority leadership protected its more vulnerable members. It was also shown that the difference in vote shares between the first and second party at the municipal level is negatively associated with per capita grants in the period from 1979 to 2002 in Portugal (Veiga and Pinho 2007) as well as the higher share of votes for the Social Democrats decreases the probability of grant recipience by the Swedish municipalities (Dahlberg and Johansson 2002), and that per capita central grants of Ghana were larger in districts where vote margins of the ruling party in the previous presidential election were smaller (Banuf 2011).

Public Choice Theory

Two competing approaches within public choice literature are designed to account for this difference.[93] Lindbeck and Weibull (1987) assert that in two-party systems both parties should favor those groups of voters whose party preferences are weak, i.e., "marginal" or "swing" voters: "[s]ince the marginal utility of consumption by assumption is decreasing, the per capita transfer to a group is a decreasing function of the absolute value of the expected party bias in the group" (p. 279). In other words, the salience of consumption issue, i.e., the value of material benefits being delivered via transfers, declines as the salience of ideological issue (the "party bias") becomes stronger.

To the contrary, Cox and McCubbins (1986) endeavor to explain stability of electoral coalitions. They argue that candidate strategies are stabilizing when candidates invest mostly in their support groups, somewhat less in swing voters, and very little or nothing at all in opposition groups. Assuming that candidates are risk-averse, they should prefer core supporters over swing voters even though swing voters are more responsive to material inducements: they are indeed more responsive but equally responsive to the offers of both candidates and therefore are a riskier investment.

Dixit and Londregan (1996) stipulate conditions under which both distributive strategies could be successful. They argue that if the parties are equal in their abilities to allocate benefits then they prefer targeting moderate or swing voters. If one party possesses an advantage in access to its core group then it will distribute benefits within its core constituency. As an example of such an advantage the authors refer to the urban political machines that were in touch with their

[93] See also literature classification by the two competing distributive strategies in Stokes, Dunning, Nazareno and Brusco (2013: 139–141).

constituency and provided their core supporters with “personal services”. However, an advantage in distribution of patronage benefits does not necessarily originate from the personal contact. Calvo and Murillo (2004) demonstrate that the Peronist Party in Argentina managed to extract political support from public sector jobs, while public employees were rather indifferent toward the opposition Radical Civic Union. This was primarily because the Peronist constituency consisted of low-income and low-educated groups (the relative characteristics of public workers in Argentina), whereas the opposition’s core supporters were more educated and better off economically and therefore more likely to be private-sector workers.

However, there could be several limitations to favoring swing voters in authoritarian regimes. Weinstein (2011) theorizes that unlike democracies, where the main purpose is to win a minimal electoral coalition, authoritarian regimes strive to bolster their dominance by demonstrating large margins of victory over the opposition candidates. This phenomenon is referred to as the “image of invincibility” by Magaloni (2006: 9). Therefore, delivering benefits to swing voters, which is more suitable for electoral democracies, is not appropriate for creating a stable support group in electoral authoritarian regimes.

In fact, swing voters are a rare species in Russian authoritarian settings. The incumbent’s smallest margin of victory varied within 24–35 percent during election years 2004–2012. Never did an opposition candidate come first at the polls ahead of Putin or Medvedev at the regional level. Even more dramatically, opposition candidates won only in 453, 477, and 1,146 out of more than 95,000 precincts in the presidential elections of 2012, 2008, and 2004, respectively. These numbers diverge essentially from the election year of 2000, the time when authoritarianism was only beginning to be established. Opposition votes outnumbered Putin’s votes in 18,055 out of 91,437 precincts. Putin was defeated with the margin of 27% by Aman Tuleev, the governor of Kemerovo oblast, in his home region. Putin also lost in four other regions to the communist Gennady Zyuganov with a margin of 3–7%. However, it can be asserted that even in 2000 the swing voter was rather a rare marginal phenomenon in Russian politics.

Besides that, by favoring swing constituencies, the incumbent runs the risk of losing his core supporters, especially if their support is based on material inducements rather than on ideological preferences, or if the core supporters’ group is tied together by ethnic or religious identities. Meanwhile, the material largess allows the incumbent to credibly commit to his promises of being the best representative of this group. In an authoritarian context, the distributive game is played not only for winning votes but also for securing the loyalty of region-level elites. If the central government is beginning to allocate greater transfers to more competitive areas it signalizes to the elites that their loyalty is not encouraged. Eventually, it may result in diminishing rates of electoral fraud, opposition repression and/or in forging anti-incumbent coalitions (defection with or without democratization). Moreover, withdrawing funds aimed at appeasement of rebellious social groups is more likely to trigger a "defrosting process" of existing social conflicts.

The literature on authoritarian regimes finds support for the proposition that self-interested politicians provide benefits for strong supporters rather than for swing voters in authoritarian settings. In her famous study of the dominant party regime in Mexico, Magaloni (2006) argues that the Revolutionary Institutional Party (PRI) withdrew poverty-alleviation funds of the National Solidarity Program (PRONASOL) from municipalities where it was the strongest and redistributed them to swing constituencies. She inferred this from the fact that "the coefficient for mun*pri88 is negative and statistically significant" (p. 137). Nevertheless, neither the main effects variables of the municipal election year and the PRI's 1988 vote share were centered to put a straightforward interpretation on the interaction coefficient's sign nor significant to pay any attention to this interaction effect, especially given that N = 9,879.

The logic of distribution of the PRONASOL funds was, however, revisited in the later work (Diaz-Cayeros, Estevez and Magaloni 2016); the PRI appeared to target the funds primarily at its core supporters. Personally targeted goods aimed to account for "clientelism", which amounted to 29 percent of PRONASOL expenditures, was demonstrated to be positively related to the PRI's vote share and negatively associated with the effective number of parties (Magaloni, Diaz-Cayeros and Estevez 2007). Also in line with expectations of the core voter approach, Diaz-Cayeros (2006) found that deviation from proportionality with respect to the population of the federal investment in Mexico was strongly associated with larger vote shares of the PRI; the PRI's vote was, however, not significant in predicting per capita revenue-sharing transfers. Blaydes (2011) uncovered that the Egyptian government under Mubarak rewarded the most loyal constituencies. The more votes were cast for the oppositional Wafd-Brotherhood alliance in the 1984 parliamentary election, the less the corresponding governorates were provided with water and sewerage. Studying not an authoritarian but a hegemonic party system in Tanzania, Weinstein (2011) presents the evidence that the ruling party Chama Cha Mapinduzu disproportionately granted benefits to the most loyal supporters.

Marques, Nazrullaeva and Yakovlev (2016) argue that the rewarding strategy (toward core or swing groups) depends on the level of economic growth. Based on the data of Russian Regions from 2000 through 2008, they found an interaction effect between United Russia's margin of victory and regional economic growth on year-to-year changes in per capita transfers. However, as Appendix E9 uncovers, this effect is primarily determined by two outliers – Chukotka Autonomous Okrug, the differences in transfers of which 6.1 times exceed the variable's standard deviation (on average between 2000–2008), and Magadan Oblast (3.1 times in 2008)[94]. Once this outlier is deleted or ranked variables are used instead those having multiple strong outliers, the interaction effect as well as main effects of United Russia's margin of victory and economic growth become insignificant.

Apart from statistical critique, Marques and colleagues' argument deserves theoretical consideration. Its general statement is worthwhile: in their attempt to maximize votes, incumbents may save resources by cutting spending in cases where it is superfluous (in economically growing core regions) and where it has no or weak impact on the vote (in slumping swing regions). Yet this assertion assumes a strong and direct effect of the economy on the vote, and this assumption does not hold in the wide range of authoritarian regimes. First, the effect of deteriorating economy on anti-incumbent voting is muted by the biased media that do not deliver objective information on economic indicators but rather strive to manipulate public opinion by misinterpreting facts, reporting false information or diverting public attention to other (frequently minor) issues. Second, the manifestation of economic dissatisfaction is limited on the electoral supply side. Since authoritarian leaders repress or co-opt viable opposition activists and ban or subvert potentially competitive parties, the available political challengers appear to be political radicals who are out of step with the median voter (Greene 2007) or loyalists (Lust-Okar 2004), regime collaborators (Bunce and Wolchik 2010), and other affiliated with the incumbent candidates who are also unattractive to voters due to their connections with the regime. Third, voter economic perceptions are not directly translated into economic voting because of voter intimidation, vote buying and other practices of

[94] These two are the most influential outliers yet the full list contains 4 negative values, which exceed two standard deviations, and 10 similarly positive outliers, including Yakutia 2000 and 2001 (2.9 > SD), Sakhalin 2008 (2.6 > SD), Kamchatka 2007 (2.5 > SD) and Tatarstan (2.3 > SD).

electoral fraud.[95] Hence, using transfers as a compensatory mechanism for economic voting, while economic voting is influenced by various authoritarian practices, is inconsistent.

Regardless of which group of voters receives benefits from distributive politics, the causal relationship between monetary flows and election results may reasonably be deemed to be unclear. Weinstein (2011: 43) points out concerning the endogeneity problem that studying the effect of past elections on future expenditures can be complicated by the fact that financial allocations may influence voters' decisions. Nevertheless, the effect of transfers on the vote is not as obvious as it may seem. Using survey data Larcinese, Snyder and Testa (2013) found no evidence that the U.S. federal spending influences vote decisions. In fact, information is a key precondition for voters' rationality in decision making. Without specially elaborated political campaigns ordinary voters may be unaware of spending patterns in their home regions as well as in regions located outside their residence.

Nevertheless, the absence of information does not entail the absence of any effect of transfers. Voters anyway consume transfers indirectly in the form of public services or in the form of economic growth and general prosperity when large public sectors of regional economies receive monetary injections from the federal level of government. The muted effect of transfers attributed to these factors may be single out by diminishing the gross regional product by the size of the transfer inflow and including both variables in the equation. However, I do not argue that transfers are used in the Russian context as a tool primarily designed to buy voters. Election results in this regard rather serve as an indicator of the regional elites' loyalty to the regime. As Chapter 6 shows, not only voters but rather elites are benefited by the incumbent with larger transfers for creating a "favorable political climate" in their regions.

[95] The Russian presidential election of 2012 in Moscow is a contrasting example of such disconnectedness of the economy and the vote. This example shows that when effects of the intervening variables are mitigated (influential alternative media are disposed in Moscow, post-2011 electoral protest and electoral observation campaign were supported by the "liberal" part of the elite having strengthened thereby the opposition, and electoral fraud was limited), one of the richest regions (the average wage in 2012 was equal 50.6 thousand rubles, the 5th place after the four mineral-producing regions) voted the less for Putin (47.9%, followed by 53.2% in Kaliningrad Oblast). By contrast, five regions listed last in the ranking – Dagestan, Kalmykia, Mordovia, Karachay-Cherkessia, and North Ossetia – with the average wage of 15.1 thousand rubles demonstrated highest levels of support for Putin (82.8%, on average). In these cases, the intervening variables obviously also influenced the relationship between the economy and the vote.

Political Alignment Theory

The political alignment literature asserts that districts – the local party, governors or mayors of which are aligned with the party that controls the central legislature or with presidential party – receive larger central remittances. Solé-Ollé and Sorribas-Navarro (2008) have found the evidence supporting the proposition that Spanish municipalities aligned with upper-level government (i.e. controlled by the same party) are granted more than others. This effect is reinforced when the aligned governments are single-party governments at both levels. Tekeli and Kaplan (2007) assert that being the mayor and the coalition government in the same party increases the amount of grants to municipalities in Turkey. Timmons and Broid (2013) found that the amount of transfers reported by Mexican municipalities considerably deviated from the amount given by the state formula in the period from 2002 to 2007. More specifically, if the mayor and the governor were affiliated with the PRI the deviation from the formula was larger. Based on the data of Indian states from 1974 to 1997 Arulampalam et al. (2009) conclude that swing and simultaneously aligned with the central incumbent states received more per capita grants. A positive effect of alignment on intergovernmental transfers was also detected in Italy by Padovano (2012). In the case of Russia under Putin, as well as in other authoritarian countries, the relevance of this theory is questionable due to the lack of variance of the dependent variable. Very few governors and regional legislatures were alligned with the opposition in the 2000s.

Political Representation Theory

The political representation literature considers the bargaining activities of public representatives to be crucial in defining the amount of centrally distributed grants. Grossman (1994) examined the allocation of federal grants to state and local governments in the U.S. and estimated that each percentage point increase in the share of seats held by the Democrats in the state legislature increased per capita grants by 0.75 to 5.08 dollars. Using a comprehensive dataset on the federal U.S. spending over 24-year period at county level Berry et al. (2010) show that districts and counties receive approximately 4-5% more funds when they are represented by members of the president's party in Congress. A better representation in the House and Senate committees was shown to be positively associated with federal grant allocations to states even though the effect varies from program to program (Rich 1989). However, controversially, a negative relationship between the number of federal seats, the proportion of federal seats decided on preferences and transfers was found by Worthington and Dollery (1998) in the Australian case.

Besides that, Atlas et al. (1995) have demonstrated the dependence of the U.S. federal net spending on overrepresentation (indicated by high levels of representatives per capita) in the Senate and House of Representatives. The variables of deputies and senators per capita were also crucial in explaining the allocation of transfers in Argentina's provinces (Porto and Sanguinetti 2001). In Norway, as well, the number of parliamentary seats per voter positively influenced the amount of central grants to municipalities and counties (Sørensen 2003).

It is worth mentioning that in the Russian case the number of State Duma deputies may presumably account for larger remittances in favor of the overrepresented regions. At the same time, the affiliation of governors with the dominant or an opposition party is unlikely to be associated with the distribution of transfers under Putin's rule. The formal governors' membership in United Russia strongly varied over time and was primarily linked to canceling direct gubernatorial elections in September 2004 when "Russia's governors were essentially forced into joining the party" (Reuter 2010: 299). In March 2003 only 9% of governors held membership in United Russia; by the moment direct elections were cancelled, this proportion rose to 26%; and nearly all (94%) governors had joined the party by November 2008.[96] Hence, membership in the "party of power" in the earlier period rather demonstrated a governor's weakness and after some moment it has virtually become compulsory and therefore non-indicative. Besides that, in the early 2000s the bulk of the gubernatorial corps consisted of independents; following the tradition of substantially personalist politics formed in the 1990s,[97] governors preferred *not* to affiliate with whatever party, so that eight major parties managed to nominate 85 candidates in the 183 gubernatorial races during 1995–2003, and only six out of these party-backed candidates won governorship afterwards (Hale 2006: 135).

[96] Calculations based on Reuter (2010).

[97] In any case, the fact is that political parties were not influential in Russian politics in the 1990s, especially at the regional level. Pointing out in this regard that the average share of party nominees in regional legislative assemblies dropped from 21.8% in the second half of the 1990s to 14.2% in the first half of the 2000s, Golosov (2011: 627) concludes that "political parties in the regions were on the edge of extinction".

Political Appeasement Theory

The political appeasement literature emphasizes the role of transfers as a tool used to pacify rebellious elites or ethnic minorities. Using the Spanish regional data in the period 1986–2006, Reino and Alcalde (2011) show that the bargaining power of the nationalist Catalonian party measured by the Banzhaf voting power index has been a significant predictor of growth in various financial benefits allocated to regions. Caldera (2011) considers that ethnically fractionalized and swing communes in Senegal, a country that also has to deal with a violent separatist movement in the southern region of the Casamance, receive larger transfers. In their study of intergovernmental transfers in China Wan, Ma and Zhang (2015) remark that the central government allocates more transfers to provinces with high proportions of ethnic minorities.

In the case of Russia, Treisman (1996, 1998a, 1998b, 1999) revealed that the transfer system in the 1990s worked to appease those regions that declared state sovereignty, threatened the central leadership with obstruction induced by mass strikes or voted against Yeltsin and pro-government parties. Stewart (1997) also examined the allocation of central transfers in Russia in the years 1993, 1994, and 1995. The results indicated that regions having special status received more per capita receipts. The analysis also employed variables of republican status, the number of workers on strike, and support for Yeltsin in the referendum of 1993, yet these interesting variables were included only in the model with tax retentions as the dependent variable and turned out to be insignificant. This study reexamines the findings of political appeasement literature in the new historical period of Putin's rule when the federal center became much stronger vis-à-vis the regions. The results show that the regions were rewarded for political loyalty to the regime rather than appeased for various manifestations of disobedience. At the same time, the alternation of the ethnic regions' position toward the federal center from opposition in the 1990s to loyalty in the 2000s has played a crucial role in the process of bargaining for the federal transfers.

Data, Variables, and Hypotheses

The data for analysis mainly come from statistical yearbooks issued by the Federal State Statistics Service (Rosstat)[98] and the United Interdepartmental Information and Statistical System (EMISS)[99]. The minor data sources and more precise references are given in footnotes. It should be noted that the number of Russia's regions was changing over time due to the process of unification of the hierarchical regions.[100] The sample includes 83 regions, which remained after the process of unification.[101] Rosstat more frequently reports the overall number for the upper-level region and the numbers for the lower-level regions. To make the data consistent I subtract the numbers of the lower-level regions from the upper-level region.[102] If the numbers are reported independently for the hierarchically unified regions, the procedure goes the other way around: I add numbers of the lower-level regions to the upper-level region. Since other variables intervene when percentage indictors are calculated, I use only values of the upper-level regions for the unified ones. In fact, the population of autonomous *okrugs* is much smaller compared to *oblasts*, therefore, taking percentage indicators' values of the latter does not considerably change the pattern.

The Dependent Variable

There could be several measures allowing us to gauge federal transfers. Per capita monetary remittances is apparently the most commonly used one. The per capita measure, however, assumes *a priori* a deterministic relationship between the

[98] Regions of Russia. Social-Economic Indicators [*Regioni Rossii. Sotsialno-Ekonomicheskie Pokazateli*]. Moscow: Rosstat. Available at:
http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138623506156

[99] Available at: https://www.fedstat.ru/

[100] The following regions were unified: Komi-Perm Autonomous Okrug and Perm Oblast were unified and renamed into Perm Krai on 1 December 2005; Taimyr (Dolgan-Nenets) and Evenki Autonomous Okrugs were merged with Krasnoyarsk Krai on 1 January 2007; the unification of Kamchatka Oblast and Koryak Autonomous Okrug into Kamchatka Krai occurred on 1 July 2007; Ust-Orda Buryat Autonomous Okrug was merged with Irkutsk Oblast on 1 January 2008; finally, Chita Oblast and Agin-Buryat Autonomous Okrug have formed Zabaykalsky Krai on 1 March 2008. Thus, the number of regions has decreased to 83.

[101] This chapter examines only federal-regional transfers though the total number of levels is defined by the administrative structure of the country. Additionally, transfers allocated from regions to cities and *raions*, and from *raions* to rural settlements may be examined in a more profound study.

[102] Take an example of non-unified hierarchical region, which has not been unified due to an obvious reason. Tyumen Oblast includes two major oil-producing *okrugs* in the country – Khanty-Mansi Autonomous Okrug and Yamalo-Nenets Autonomous Okrug. The Rosstat's numbers for them are 4,618,711.0, 2,686,074.8, and 1,192,229.6 million rubles, respectively. Since the first number includes the two subsequent, I diminish it by them to obtain the GRP value only for Tyumen Oblast without *okrugs* that is 740,406.6 million rubles – considerably smaller than the GRPs of the two formally lower-level *okrugs* subordinated to the *oblast*.

monetary flow and the number of persons in jurisdictions though this may not be the case in practice. Weinsten (2011) points out that districts with large populations require less financing due to economies of scale and the fixed costs associated with the delivery of public services. In fact, economists have long discovered that production costs grow with the number of goods being produced, while administrative, promotion and similar costs are relatively fixed (Moore 1959; Giora 1975). Therefore, sparsely populated jurisdictions such as Chukotka or Kamchatka may require larger transfers just to maintain the functioning of minimally sufficient administrative bodies.[103] For this reason the negative correlation between per capita transfers and population that has been found in the literature (Grossman 1994: 298[104]; Levitt and Snyder 1995; Calvo and Murillo 2004) may be substantively spurious. The measure of transfers in the absolute numbers of currency controlled by population in regression analysis allows us to take into account a possibly probabilistic nature of the relationship between transfers and population and to avoid the bias.

Ansolabehere and Snyder (2006), in a slightly different manner, employed county per capita transfers relative to state per capita transfers. This approach might have been used as a tool to control for regional idiosyncrasies if all explanatory variables had been similarly measured. However, it does not help to overcome the general oddity of per capita measurement resulting from economies of scale.

The group of per capita indicators also includes net per capita transfers (i.e., the central payments to regions diminished by taxes paid in the federal budget) Treisman 1996, 1998a, 1998b, 1999). Although a theoretical rationale underlies the net transfers – how much a region receives in the net remainder – it is hardly convenient for using from a statistical point of view, inasmuch as diminishing by federal taxes provides a skewed distribution with multiple outliers on the both tails of the variable. As with the net per capita transfers in 2012, the variable’s distribution is so strongly skewed that even after zero-skewness log-transformation is applied, the Shapiro-Wilk test for normality rejects the hypothesis that the data

[103] For instance, if we simply extrapolate the Moscow’s ratio of the number of ministerial portfolios (62) over the region’s population (12.1 million) to Kamchatka, whose population is slightly bigger than three hundred thousand, then we predict that only four ministers instead of 25 acting top officials in the government should serve the region’s needs.

[104] Grossman argues that remitting greater transfers to small states is beneficial since the number of recipients is small while the costs are spread across all taxpayers.

are distributed normally with $p < 0.000$.[105] Therefore, I refrain from using this variable in analysis.[106] Nevertheless, I find the idea of considering not only the federal payments but also monetary remittances back to the center useful. The relationships between variables in the allocation of federal transfers may presumably vary by *budget type*. To control for this, I introduce a dummy variable coded 0 (Donor) if the region pays more taxes into the federal budget than it receives money in the form of transfers, and 1 (Recipient) otherwise.

Another indicator is the share of transfers in the region's budget (STB). Calvo and Murillo (2004) employed both – the share of federal transfers in Argentina's provincial expenditures and the province's share of federal transfers in total national amount of federal transfers over its population ratio to national population[107] – and found substantively similar results regardless of the measures being used: the Peronist Party's vote share was positively associated with transfers.

In the current analysis I rely on three measures of transfers: the *share of transfers in the budget, per capita transfers, and raw transfers measured in rubles.*[108] The STB is expected to be the main and the most indicative among them: the larger is the share of transfers in the regional budget, the more the region is dependent on the federal remittances. The other two variables are employed more for purposes of robustness checks. I also use the *share of total transfers* (STT) – the region's share of transfers in the total federal amount of transfers – to avoid the impact of inflation and year-to-year fluctuations in the total size of the transfer fund for tracing change in transfers over time.

[105] Three observations over 4.8 times as the standard deviation (163,831.3 RUB) lay below the mean (-28,287.1 RUB) but these observations 68.4 times more than the median absolute deviation (11,914) lay below the median (3,455.1 RUB). On the right tail there are no outliers if we infer from the standard deviation. However, the standard deviation is not a robust estimator of dispersion for skewed distributions. The median absolute deviation, which fits the latter condition, shows that the maximal value belonging to Chukotka Autonomous Okrug (109,007.4 RUB) exceeded the median by 8.9 times. Overall, seventeen observations outlie over two median absolute deviations below the median, and ten outliers are located above.

[106] For exploratory purposes, I tried to run a model with net per capita transfers in 2012 as the dependent variable. In regions that were net recipients of transfers the effect of the incumbent's vote was very similar to that presented in the main text, yet the effect of regional taxes was with an unexpected positive sign. The White test for heteroscedasticity of residuals applied to the best model indicated that the residual term is not with random variance at $p = 0.086$. Two other models, which include regions that were net donors of transfers, and all observations, did not pass the White test at all. I also tried using a ranked variable of net per capita transfers. The results were similar to the results shown in the main text with one exception, namely, that regional taxes were again positively related to transfers among donor regions. A model that included all cases nevertheless did not pass the White test due to reasons discussed in the text below.

[107] The latter measure called as "Relative Revenue Sharing Ratio" is virtually transfers per capita relative to its sample's average.

[108] The total amount of transfers is used for constructing the variables. Alternatively, Appendix E2 examines the allocation of various subtypes of transfers.

Equalizing Regional Budgets

Ideally, federal transfers are aimed at leveling cross-regional income disparities and alleviating social need. Although these two goals look similar, it would be better to differentiate between them inasmuch as equalizing politics considers only the region's tax revenue without regarding the actual region's need in external assistance. In fact, between two regions with a similar tax base one may be needier than the other because its fixed assets are more depreciated (dilapidated dwellings, crumbling roads, etc.) or the structure of its economy allows more unemployed and destitute people. Thus, two variables associated with equalizing cross-regional disparities are used in the analysis. I expect that regions with higher *gross regional product (GRP) per capita* and larger tax base measured as the total amount of levied *regional taxes per capita*[109] should receive smaller federal remittances. These indicators can be found in several formulas employed by the central government for allocating transfers and presumably should strongly impact the distributional pattern.

Alleviating Social Need

Percentage of *unemployment* and percentage of *population with income below the living minimum* are expected to directly measure the extent of a region's need from social perspective. From an economic perspective, I create two indices measuring the degree of development and condition of the regional infrastructure. An earlier study has shown that contrary to expectations the index of regional infrastructure development, which includes telephones per hundred of urban residents, doctors per thousand residents, housing space per capita, and hospital beds per thousand residents, is positively related to transfers (Treisman 1996: 299–335). The author came to conclusion that "the poorer the provision of housing, medical and education services in a region, the less it seemed to receive in subsidies, grants, credits and privileges" (p.323). However, regions with more developed infrastructure, without having their own funds, may receive more transfers merely

[109] Regional taxes denote the total amount of tax money collected in regional budgets (the Russian tax system differentiates taxes on those paid only in the federal budget, paid only in regional budgets, and taxes shared in various proportions between the center and regions). Since the data are available only for 2006 and onwards, the missing values of 2000 and 2004 have been predicted based on median annual changes (MAC). The MAC approach guarantees more precision then the forecast based on ARIMA model due to the monotonic and heavily trended budget revenue process. In this case ARIMA produces 62 negative and hence irrelevant predictions for 2000 while all MAC predictions are positive and generally consistent with the data. After having been forecasted the data were inflation adjusted, i.e., returned to the constant prices of 2012. Source: EMISS, at https://fedstat.ru/indicator/42547

to maintain their large infrastructure in a proper condition but not to invest in construction of new infrastructural objects.

To draw a more detailed picture, I introduce a similar index of infrastructure development along with an index of the infrastructure condition. I do not have any clear expectations about the first index but expect that in accordance with the equity principle regions whose infrastructure is in worse condition should receive larger transfers. The indices are based on standardized z-scores and defined as follows:

$$Infrastructurre\ Is\ More\ Developed = \left(\frac{Children\ Coverage\ by\ Kindergartens, \% - \mu}{\sigma}\right) + \left(\frac{Roads\ Density - \mu}{\sigma}\right) - \left(\frac{Population\ per\ One\ Hospital\ Bed, Residents - \mu}{\sigma}\right)$$

$$Infrastructure\ Is\ in\ Worse\ Condition = \left(\frac{Share\ of\ Fully\ Depreciated\ Fixed\ Assets - \mu}{\sigma}\right) + \left(\frac{Share\ of\ Dilapidated\ and\ Wrecking\ Housing - \mu}{\sigma}\right) - \left(\frac{Share\ of\ Regional\ and\ Municipal\ Roads\ Meeting\ the\ Requirements - \mu}{\sigma}\right),$$

where μ is the mean and σ is the standard deviation.[110]

[110] *Note*: Variables with skewed distributions have been log-transformed before constructing the indices (see transformation details in Appendix E8). After constructing the indices as defined by the formulas the indices have been again standardized, i.e., differenced by their means and divided by standard deviations (due to combination of the three variables the standard deviations of the initially calculated indices exceeded 1). I did not use factor analysis since the number of variables is small and it would be better to know their meaning on average without adding more weight to particular variables.
The data on the Share of Regional and Municipal Roads Meeting the Requirements (Roads Condition) are taken from EMISS, at http://www.fedstat.ru/indicator/data.do?id=50215&referrerType=0&referrerId=1293268. Inasmuch as the data on the Roads Condition are available on the annual basis only beginning from 2007, the values for years 2000 and 2004 have been predicted using *auto.arima* (package “forecast” in R), which returns best ARIMA model according to either AIC, AICc or BIC value. In three cases the values of 2000 were predicted beyond the reasonable bounds (> 100 or < 0). In two these cases predictions of 2004 have been used instead. In Chechnya however even prediction for 2004 appeared to be lower than zero; the predictions for 2000 and 2004 have been substituted by the value of 2007. ARIMA (back)forecasting is more suitable compared to average (median) annual changes approach for time series that do not have stable trends but rather exhibit changing patterns over time. Roughly speaking, ARIMA attributes more weight to the tail of time series, which is closer to the forecasting period, then to the overall trend. For the Roads Condition, the forecast of 2000 based on the median annual changes produces five predictions falling beyond the interval [0, 100] and

Political Objectives

The vote share for the incumbent president or party is seemingly the most widely used indicator of political interests in the allocation of the central grants. It may, however, be reasonably argued that the official incumbent's vote in autocracies contains essential portions of fictitious votes resulted from electoral manipulations. In fact, the findings of the previous chapter indicate a strong exposure of the Russian electoral data to various types of electoral fraud. Nevertheless, high-level authoritarian officials judge about performance of their lower-level counterparts not from the true vote but from the official vote sheets. The forged vote in this case is not deemed as a "defective vote" or something intrinsically negative; in the authoritarian system, electoral fraud is rather encouraged. From this standpoint, the fictitious vote is at least as valuable under authoritarianism as the sincere vote. The fictitious vote may equally demonstrate strength of the leader since a lot of political resources is needed to effectively perpetrate fraud.[111] Therefore, I do not differentiate here between the fraudulent vote and the true vote and treat them as a single variable. Namely, the incumbent's vote in the federal presidential elections is used to account for the major political interest in the area.

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predictions are generally less relevant to the observed data than predictions by ARIMA model. Spline prediction also performed poorer compared with ARIMA.

Roads Density (*RD*) denotes meters of roads per the product of population and area measured as follows: $\mathrm{RD_i} = \sqrt{\frac{\mathrm{R_i}}{\mathrm{A_i}} \times \frac{\mathrm{R_i}}{\mathrm{P_i}}}$, where *R* refers to the total length (in meters) of roads in *i*th region, *P* to population (residents), and *A* to the area (km^2). The indicator based on the geometric mean of population and area in the denominator performs much better in densely populated or underpopulated regions compared with the ordinary indicator (roads per area). It follows from the fact that in sparsely populated large regions having the same length of roads as in densely populated large regions is not necessary while having the a similar road length is reasonable in small but densely populated and in large but sparsely populated regions. For instance, in 2012 the difference in roads per area between the first and the last regions in the ranking has been more than two thousand times larger (2,156 m/km^2 in Saint Petersburg and 0.9 m/km^2 in Chukotka Autonomous Okrug); and Saint-Petersburg stood out 5.5 standard deviations above the mean (246.3 m/km^2). Once population is taken into account the gap in provision of roads between Saint Petersburg and Chukotka decreases to eleven times (36.1 m/capita-km^2 in Saint Petersburg and 3.4 m/capita-km^2 in Chukotka); and Saint Petersburg appears to be normally provided with roads relative to the national average (34.9 m/capita-km^2).

The data on the other variables come from Rosstat.

[111] Kalinin and Mebane (2012) argue that electoral fraud is used in Russia to signal loyalty by governors to the federal center in order to receive more transfers. Controlling for the incumbent's vote and turnout rate, they found that higher levels of last-digit proportions of zeroes and fives in the distributions of turnout in the presidential elections are associated with larger post-electoral per capita transfers in 2004 and 2008. Empirically, however, this result may depend on model specification. Theoretically, there is counter-intuitive to expect that central-level politicians require electoral fraud as an indicator of governors' loyalty rather than something that [not necessarily is but at least] can be presented as a result of the popular voting. Therefore, I assume that regional elites strive to receive larger transfers by delivering more impressive electoral results to central incumbents and central incumbents willingly reward regional elites for their loyalty, whereas both actors admit that the electoral game is unfair and the electoral system is permissive of fraud, yet at the same time, fraudulent votes should necessarily be presented to the general public under the guise of real votes.

The relationship between transfers and the vote may, however, appear in both directions. Treisman (1998a: 904) points out that contrary to the straightforward political logic, "[r]egions that voted most strongly against the main pro-reform or pro-government blocs in 1993 and 1995 received larger net central transfers per capita in subsequent years. And regions whose governor took up the political banner of the central "party of power", agreeing to run on Chernomyrdin's Our Home is Russia electoral list, were "rewarded" for such loyalty with lower net allocations". Nevertheless, I suppose that the situation changed in the 2000s. When Putin came to power the new agreements on the delimitation of powers between regions and the federal center, widely practiced under Yeltsin, ceased to be signed. Out of 42 agreements with 46 regions, constituted between 1994 and 1998, 33 terminated up to May 2003 and almost all agreements expired by the end of 2005 (Chertkov and Kistrinova 2014). The last agreement, which rather had a symbolic character,[112] was signed with Tatarstan in 2007 and was valid up to 2017 (Samohina 2017). The concurrent process of bringing the regional legislation in compliance with the federal law, which was also initiated by Putin, was over in June 2009 when the parliament of Yakutia, the last after those who declared state sovereignty in the early 1990s, eliminated the word "sovereignty" from the republican constitution (Rybin 2009). Correspondingly I expect that the politics of fiscal appeasement has turned to the politics of fiscal rewarding when the most loyal regions are more cheerfully granted with federal money than their less supportive counterparts.

Treisman (1996) also found that the strongest explanatory variable that predicts the distribution of transfers appeared to be a dummy whether the region *declared sovereignty*[113] by January 1991.[114] He also noted that neither the titular nationality

[112] The first agreement of 1994 stipulated that Tatarstan may issue its own currency, levy taxes, the mineral resources were declared an exclusive property of the Tatar people whereas the agreement of 2007 allowed the Tatars only having the Russian passport with an inset on the Tatar language; candidates for the post of the head of the republic should speak both – Russian and Tatar – state languages.

[113] I use the Treisman's coding of the sovereignty declarations (1998a: 203) with several exceptions. Checheno-Ingush Republic divided into Chechnya and Ingushetia afterwards. I coded both regions as declared sovereignty. Komi-Perm Autonomous Okrug, which declared sovereignty in 1990, in December 2005 merged with Perm Oblast in Perm Krai as well as Koryak Autonomous Okrug declared sovereignty and merged with Kamchatka Oblast in Kamchatka Krai in July 2007. I code the regions emerged after the unification as declared sovereignty. Finally, Tuva Republic is absent among the declarants in Treisman's database, however On December 12, 1990, the Supreme Council of the Tuva ASSR adopted the Declaration on the State Sovereignty of the Soviet Republic of Tuva (see: http://www.tuva.asia/journal/issue_14/4816-ondar.html). I code Tuva as declared sovereignty as well.

[114] Another strongly significant variable from Treisman's analysis associated with bargaining power of regions however became irrelevant in the 2000s: in 2012 about 500 people from six organizations participated in strikes in five regions. In other years the numbers were also small. In 2010 there were no registered strikes at all. Strikes therefore are not used to operationalize the bargaining power of regions.

variable nor the non-Russian population variable was significant when added in the model simultaneously with the sovereignty declarations. I question this finding and argue that the propensity to declare state sovereignty as well as the probability of receiving transfers are largely impacted by ethnic and religious composition of the regions. To account for this, I use the share of *non-Russian* population and the share of *non-Orthodox Christians*, i.e., all other religions and denominations that do not belong to the Russian Orthodox Church (atheists are not counted).[115]

Alternatively, the bargaining power of regions may be indicated by the number of *years a governor holds office*[116] and by the number of the *State Duma MPs per one million of population* representing the region.[117] Although strikes and mass

[115] The data come from The Atlas of Religions and Nationalities of Russia (Available at: http://sreda.org/arena). The sample of the survey conducted in 2012 includes 56,900 respondents in 79 regions with 500 to 800 respondents per each region. The missing values were treated as follows: Nenets and Chukotka autonomous districts were defined as mainly pagan and their shares of non-Orthodox Christians were set at 95th percentile of paganism among other regions. Chechnya and Ingushetia were defined as Muslim regions and their shares of non-Orthodox Christians were set at 95th percentile of Islam among other regions. The data on ethnic composition were taken from The General Census of 2010 at: http://www.gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm. I preferred using The Atlas of Religions and Nationalities of Russia over the general census because the census does not contain the information on religious identification.

[116] Source: The list of of heads of subjects of the Russian Federation. Available at: https://ru.wikipedia.org/wiki/%D0%A1%D0%BF%D0%B8%D1%81%D0%BE%D0%BA_%D0%B3%D0%BB%D0%B0%D0%B2_%D1%81%D1%83%D0%B1%D1%8A%D0%B5%D0%BA%D1%82%D0%BE%D0%B2_%D0%A0%D0%BE%D1%81%D1%81%D0%B8%D0%B9%D1%81%D0%BA%D0%BE%D0%B9_%D0%A4%D0%B5%D0%B4%D0%B5%D1%80%D0%B0%D1%86%D0%B8%D0%B8

[117] It is a difficult task to identify whom the State Duma deputies really represent. The regional affiliation, which is given on the official Duma website (http://www.duma.gov.ru/about/history/convocations/6/), is misleading for several reasons. First, about 37% of deputies represent more than one region. Second, their regional affiliation is often dubious so long as many deputies never lived in their regions of representation for any considerable period of time. This situation follows from the fact that the majority part of the mixed majority-proportional electoral system, which was adopted since 1995, was canceled in 2007. Single member districts, however, were reintroduced in 2016, yet the negative effect of proportionality continued to apply to the half of deputies as it occurred before. Not only small regions have less than one representative due to proportional distribution of mandates across population, all State Duma parties used to include in election lists such candidates who have no contact with regions that they represent. For instance, Andey Andreev, the Communist Party's representative of Komi Republic and Arkhangelsk Oblast in the State Duma of the sixth convocation, was born in Tomsk brought up in Udmurtia graduated in Moscow in 1999 and since then he permanently lives in the capital city. A Komi newspaper Krasnoe Znamya points out that this practice resembles Stalin's times when the first North Pole pilot Mikhail Babushkin became a deputy of the Supreme Soviet of the USSR from the Syktyvkar electoral district in 1937. The pilot's name is now assigned to a street in Syktyvkar, the capital city of Komi Republic, though neither in Syktyvkar nor in the Komi ASSR this remarkable pilot had ever flown (Sumarokov 2014). To control for these discrepancies I adjust regional affiliation of deputies by their biographies. A deputy is attributed to that particular region where he or she before taking the mandate 1) resided for considerably long period of time, 2) held elected or executive office, 3) had or has business. In any case the most recent affiliation is considered. If a deputy, for instance, is an incumbent, who each new term is elected in different regions, his regional affiliation is attributed to Moscow. Thus, due to prevalence of the nation-level artists, sportsmen, businessmen, and incumbents the number of deputies affiliated with Moscow increases to 131 compared with 26.5 as it officially declared (the number is not integer since multiple affiliations have been divided by the number of regions being represented). Out of 447 deputies each region was represented by 5.4 on average, yet three and less deputies served the social interests in 49 regions, 8

demonstrations have nearly come to naught in the 2000s the scope of terrorism remained remarkably stable. The number of terrorist attacks in the presidential election years and in three preceding years amounted to 32 in 2000 and 2004, 16 in 2008, and 47 in 2012.[118] Overall, 127 terrorist attacks in 18 regions were committed during 16 years or 7.9 annually with the maximal number recorded in Dagestan – 28. Since the variable's distribution is strongly skewed I use a dummy indicating whether any number of terrorist attacks has taken place (coded 1) or not (coded 0). This measure may help to account for appeasement strategy in allocation of transfers. I also use a dummy variable based on reports of the Network for Ethnological Monitoring and Early Warning of Conflicts (EAWARN) (Tishkov and Stepanov 2014: 359; Tishkov and Stepanov 2011: 243; Tishkov and Stepanov 2004: 253) indicating whether a *conflict situation* is present in the region. The variable is coded 1 if "notable conflicts" or "conflict situation" was reported; "weak tension" and "stable situation" are coded 0. This variable is supposed to tap more precisely the appeasement strategy of the incumbent toward regions engaged in ethnic conflicts. All four variables are expected to have a positive association with the transfers.

Other Variables

The federal transfers may hypothetically be allocated with a bias in favor of more authoritarian regions. It may occur either due to stronger bargaining power of such regions or because of their similarity with the central government: it may be a kind of alignment effect when the central autocrats promote local autocracies by donating more resources for their functioning. More precisely, central transfers may be used for buying loyalty of regional elites who presumably then respond with more suppression of political and civil freedoms in their regions. I use two proxies

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regions had no representatives at all. I experimented with several measures of regional representation – biographically adjusted MPs, non-adjusted MPs, United Russia's MPs – performance of the first variable appeared to be the best (see Table E4 in Appendix E2).

[118] Source: The list of terrorist attacks in Russia. Available at: https://ru.wikipedia.org/wiki/%D0%A2%D0%B5%D1%80%D0%B0%D0%BA%D1%82%D1%8B,_%D1%81%D0%BE%D0%B2%D0%B5%D1%80%D1%88%D1%91%D0%BD%D0%BD%D1%8B%D0%B5_%D0%B2_%D0%A0%D0%BE%D1%81%D1%81%D0%B8%D0%B8

to gauge this effect. Namely, the index of *Press Freedom*[119] and the *Media Persecution index*[120] are expected to be positively associated with the transfers.

Exploratory Analysis

The data on the dependent variables – the share of transfers in the budget, per capita transfers, and raw transfers measured in rubles – are taken for 2001, 2005, 2009, and 2013 – the years following the presidential elections. The rationale behind this is that budget is voted a year before its implementation. Therefore, all explanatory variables follow with one-year lag relatively to transfers and coincide with election years. I forgo including the lagged dependent variable (LDV) – as, for instance, Arellano and Bond (1991) – in the analysis since the LDVs generally don't have a clear causal interpretation. Moreover, they change coefficients (from time to time, in the opposite direction) and suppress significance levels of substantively important variables whereas the bias increases with the degree of serial correlation (Achen 2000).[121]

Later on, the arguments of Achen were revisited by Keele and Kelly (2006). Using Monte Carlo experiments with simulated time-series data, they found that the LDV models lead to much stronger bias than ARMA models if the dependent and explanatory variables are autocorrelated. The section *Taking Time into Account*

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[119] The expert index is developed by the Glasnost Defence Foundation. For the year 2010, the scale includes four ranks where 1 indicates "free" (0 cases), 2 denotes "relatively free" (16 cases), 3 denotes "relatively unfree" (44 cases), and 4 states for "unfree" (22 cases). I reversed this scale so that 4 is recoded into 1, 3 is recoded into 2, and 2 is recoded into 3. Available at: http://www.gdf.ru/map/list/2010.

[120] Since many expert indices are inherently biased, I alternatively employ a more objective measure based on reports about media conflicts made by journalists. All reports in the database "Russia: Mediaconflicts", which are brief summaries of incidents occurred with journalists, were grouped into three categories in ascending order of pressure: 1 includes intimidation and censorship; 2 includes attack on/blocking of website, detention, withdrawal of issue, assault, employee layoff, and legal prosecution; and the most repressive incidents of the category 3 include assassinations of journalists. All incidents reported between 2007 and 2012 are then summed by regions with using geometrically increasing weights, so that the incidents on category 1 (N = 529) are summed without a weight, the number of incidents in the category 2 (N = 1,110) is multiplied by three, and assassinations (N = 20) receive nine times more weight than intimidation and censorship. Then the index's score is divided by the region's population (in millions) to more proportionally represent the number of reported attacks on journalists. The database is available at: http://www.mediaconflicts.org.

[121] I tried to run the full model from Table 5.1 having additionally included the STB_{2012} to the set of predictors. The result is that out of the full set of predictors only the proportion of population with income blow the living minimum was significant at 0.043 along with the STB_{2012} (0.000). In qualitative terms, keeping all other variables at their means, the increase of the STB_{2012} from its 5th to 95th percentile increases the STB_{2013} from 5 to 83 percent while the corresponding increase of the proportion of population with income below the living minimum just slightly deviate the STB_{2013} from its mean by changing its value from 28 to 33 percent. The result is expectable due to strong correlation between the STB_t and the STB_{t-1}: since the STB_{2012} account for 95% of the STB_{2013}'s variance, all other explanatory variables have a very little chance to reveal their explanatory power.

examines the effect of time by using changes in the share of total transfers being explained by changes in the predictor variables instead the LDV. It must also be noted that all variables with strongly skewed distributions have been log-transformed in order to solve the problems of non-linearity and heteroscedasticity, and to ensure that regression coefficients being derived are the best linear unbiased estimators (BLUE). See Appendix E8 for details.

Table 5.1. OLS models explaining the allocation of transfers in 2013

DV: Share of Transfers in the Budget	Full Model	Equalizing	Social Need	Political Objectives	Best Model
Constant	-6.92 (-.426)	76.06*** (11.963)	-21.11*** (-3.271)	-35.83** (-2.606)	-4.629 (.758)
Log Regional Taxes Per Capita	-.000* (-1.701)	-.000* (-1.715)			-.000*** (-6.053)
Log GRP Per Capita	-.000 (-.516)	-.000 (-1.015)			
Log Unemployment (%)	.526 (.672)		3.984*** (4.485)		
Population with Income Below the Living Minimum (%)	1.197*** (2.944)		1.576*** (3.148)		1.334*** (3.887)
Infrastructure Is More Developed	5.692*** (2.696)		.809 (-.350)		5.12** (2.491)
Infrastructure Is in Worse Condition	-5.74*** (-2.678)		-3.220 (-1.107)		-5.475** (-2.619)
Putin's Vote (%), 2012	.577*** (3.494)			.766*** (3.763)	.586*** (3.646)
Declared Sovereignty in the Early 1990s	7.867** (2.48)			9.56** (2.248)	8.702*** (2.874)
Terrorist Attacks 2009–2012 [Attacked]	4.912 (1.391)			8.267* (1.718)	
Log Media Persecution Index 2007–2012	.064 (1.604)			.132** (2.405)	.072** (1.889)
Log Years Governor in Office up to 2012	.561** (2.661)			.817*** (2.736)	.562*** (2.693)
Log MPs Per 1 mln. pop.	-2.251* (-1.892)			-2.722* (-1.747)	-2.232* (-1.968)
R-squared	.768	.460	.476	.457	.760
White's heteroscedasticity test	.434	.000***	.001***	.338	.131
N	83	83	83	83	83

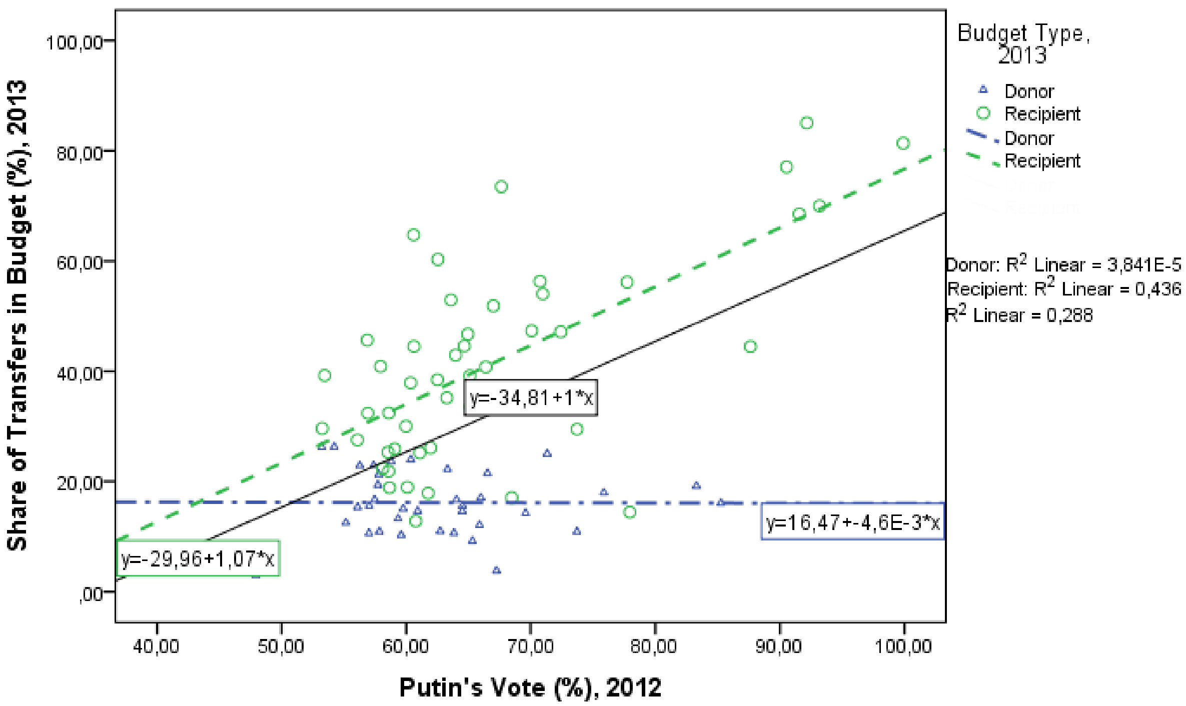
Note: Entries are unstandardized coefficients with t-values indicated in parentheses. Here and hereinafter H(0) for White test: residuals are homoscedastic. Hence, significant p-values indicate heteroscedasticity of residuals. Variables of the best model are selected by maximizing variance explained under the condition of fewer wasted degrees of freedom. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Results of the regression models in Table 5.1, first of all, indicate that a roughly equal share of variance is explained by the models of equalizing regional budgets, alleviating social need, and political objectives – about 45%. A similar conclusion follows from the full and the best models: the allocation pattern of transfers is neither determined by impartiality reasons only, nor by exclusively political concerns, but it rather represents a combination of them. All variables have the expected signs with the exception for two. As in the best model, a better representation in the federal parliament is negatively associated with the central monetary remittances.

As it was noted, I do not have clear expectations about the index of infrastructure development, however, its positive sign in combination with a negative sign of the index of infrastructure condition should rather be interpreted such that regions with better infrastructure received more federal transfers. Nevertheless, I do not draw final conclusions from these models so far as Equalizing and Social Need models do not pass the White test for heteroscedasticity of residuals and the best model is close to the crucial 10-percent level of significance.

Figure 5.2 aims to account for the models' failure in the White test. The residuals were diagnosed as not having random variance because two groups of observations evidently exist in the data, namely, regions that were net donors of the federal taxes and regions that were net recipients of the federal transfers. When the share of transfers in the budget is regressed on the Putin's vote the relationship between them appears only in the group of recipients (R^2 = 0.44), while the donor regions show no association between transfers and the vote (R^2 = 0.0). This may possibly occur due to a threshold effect. On the scatterplot, this threshold is located at about 20% – the value separating donors from recipients. The association between transfers and the vote may presumably by weak or absent in the donor regions because the federal center treats them differently from the recipient regions: the regional economies of the donors are self-sufficient, their average share of transfers in the budget is small therefore tranches of transfers are much less relevant for them than to the recipients. The supposition that the federal center treats regions differently based on their ratio of paid federal taxes to received transfers is confirmed by the fact that heterogeneity of residuals is detected by the White test in the Equalizing and the Social Need models. Thus, the overall estimate is inconsistent since it violates the basic assumption of regression analysis on data homogeneity.

Figure 5.2. The inconsistency between the overall OLS estimate and within-group estimates in predicting transfers



To delimitate donor and recipient regions, Table 5.2 reports results of regression analysis separately for these two groups. As expected, the overall pattern of the allocation of transfers is strongly dependent on whether the region is net donor of federal taxes or net recipient of federal transfers. Nearly all associations are statistically insignificant for the donors. Only the level of unemployment and per capita taxes levied by the region's budget defined the federal receipts in this group. In contrast, the relationships are stronger for the recipients even compared with the models in Table 5.1. Out of all politically neutral predictors only the region's own per capita tax revenue and the proportion of indigent people are associated with the transfers. The indices of infrastructure development and infrastructure condition as well as the percentage of unemployed perform poorly among the other variables to be included in the best model.

Table 5.2. OLS models explaining the allocation of transfers in 2013 by budget type

	Recipients					Donors				
DV: DV: Share of Transfers in the Budget	Full Model	Equal-izing	Social Need	Political Object-ives	Best Model	Full Model	Equali-zing	Social Need	Political Object-ives	Best Model
Constant	-13.69 (-.558)	82.09*** (9.443)	-5.283 (-.563)	-30.13** (-2.312)	-13.47 (-.683)	19.31 (1.156)	29.69*** (6.47)	6.065 (1.247)	20.54* (1.782)	21.43*** (3.912)
Log Regional Taxes Per Capita	-.000 (-1.433)	-.000 (-.919)			-.000* (-1.843)	.000 (.541)	.000 (.162)			-.000*** (-2.888)
Log GRP Per Capita	.000 (.209)	-.000 (-1.252)				-.000 (-1.316)	-.000 (-1.035)			
Log Unemployment (%)	-.142 (.108)		3.442** (2.605)			.698 (1.012)		.903 (1.666)		.995** (2.387)
Population with Income Below the Living Minimum (%)	1.332** (2.527)		1.274* (2.111)		1.23*** (3.028)	.037 (.076)		.368 (.996)		
Infrastructure Is More Developed	3.221 (.974)		-4.139 (-1.443)			3.011 (1.206)		2.257 (1.036)		
Infrastructure Is in Worse Condition	-4.760 (-1.615)		.396 (.112)			-1.650 (-.743)		-.868 (-.442)		
Putin's Vote (%), 2012	.564** (2.542)			.653*** (3.363)	.426** (2.163)	.040 (.217)			-.111 (-.643)	
Declared Sovereignty in the Early 1990s	11.63** (2.710)			13.737*** (3.109)	11.51*** (2.904)	.9 (.311)			.581 (.207)	
Terrorist Attacks 2009–2012 [Attacked]	3.11 (.685)			3.589 (.777)		-3.438 (-.797)			-7.861* (-.924)	
Log Media Persecution Index 2007–2012	.078 (.211)			.176*** (3.336)	.093* (1.775)	.018 (.393)			.004 (.085)	
Log Years Governor in Office up to 2012	.817** (2.691)			.810** (2.452)	.763** (2.597)	.137 (.198)			.173 (.943)	
Log MPs Per 1 mln. pop.	-1.795 (-1.205)			-.831 (-.555)		.355 (.263)			.649 (.5)	
R-squared	.774	.400	.513	.664	.742	.440	.217	.215	.145	.332
White heteroscedasticity test	.289	.019**	.300	.367	.246	.365	.000***	.562	.329	.168
N	47	47	47	47	47	36	36	36	36	36

Note: Entries are unstandardized coefficients with t-values indicated in parentheses. Variables of the best model are selected by maximizing variance explained under the condition of fewer wasted degrees of freedom. Significant at: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

On the other hand, four out of six variables of political objectives turn out to be significant in the Political Objectives and the Best models. Apparently the higher was the share of Putin's votes in a region, the longer its governor held office, the more its journalists were persecuted, especially if the region declared state sovereignty in the early 1990s, the larger was the share of transfers in its budget in 2013.

Terrorist attacks and representation in the State Duma nonetheless do not demonstrate any impact on allocation of transfers. As to the terrorist threat, one explanation might be that there is no obvious responsible actor to be appeased by means of transfers in this case. Another explanation implies that this finding is favorable to the basic argument about the distributive logic based on political loyalty. The Kremlin, as noted earlier, has successfully thwarted attempts of signing new agreements on delimitation of powers between the federal center and the regions, it was also done away with the attributes of sovereignty in the regional legislation. Thereby governors' attempts to promote terrorism for the purpose of bargaining more federal money would come to a bad end. The insignificance of the parliamentary representation in all models may be accounted for by two interdependent facts. First, this is the federal government that defines the rules and implements the allocation of transfers. Second, the State Duma is a strictly (formally and informally) subordinate institution in the Russian political system. The recent research shows that the State Duma amended only about 0.1% of the average federal spending on transfers in 2011–2016, and these amendments were more likely initiated by the executive (Noble 2017: 511). Therefore, the Russian parliament may hardly intervene in the process of disbursement of the federal transfers.

It should be mentioned that all models pass the White test with exception of the Equalizing model in both donor and recipient regions. The problem with the model is also implicitly indicated by the relatively high R-squared while all variables in the model are insignificant, a problem that is usually attributed to multicollinearity. In fact, regional taxes per capita and GRP per capita have 89% of the common variance. I dwell on more detailed examination of this problem in Appendix E3, which shows that there is no direct effect of GRP on the STB but that the relationship between gross regional product and transfers is mediated by regional taxes. I use only the mediator variable for purposes of further analysis.

Another finding from our models also requires more scrutiny. The variable of sovereignty declarations appeared to be significant enough in all model specifications among the recipients. This persistence of the effect of sovereignty declarations in the early 1990s on allocation of the federal transfers in 2013 seems surprising when more than twenty years have passed since then. However, it would be unreasonable to assume that the federal officials still keep in mind those declarations voted by the regional parliaments in the early 1990s. It is more plausibly that other factors, which have affected the adoption of the sovereignty declarations then, continue to have an impact on federal-regional politics nowadays.

Table 5.3. OLS models explaining the allocation of transfers, recipients[122]

DV: Share of Transfers in the Budget	Mod. 1	Mod. 2	Mod. 3	Mod. 4
Constant	35.41*** (10.918)	37.58*** (17.229)	36.02*** (13.128)	36.88*** (10.320)
Declared Sovereignty in the Early 1990s	6.657 (.902)		13.686** (2.611)	.12.072 (1.581)
Log Non-Russians (%), Centered[a]	.111 (.679)	.217* (1.889)		.253* (1.878)
Log Non-Orthodox Christians (%), Centered[a]	.444** (2.269)	.427** (2.200)	.471*** (3.008)	
Interaction: Log Non-Russians × Log Non-Orthodox	.009** (2.583)	.010*** (3.115)		
R-squared	.580	.572	.514	.457
White heteroscedasticity test	.57	.677	.471	.488
N	47	47	47	47

Note: Entries are unstandardized coefficients with t-values indicated in parentheses. a. In the result of centering by subtracting the means of independent variables the coefficient of X or Z can be interpreted as the effect of that variable on Y at the mean level of the other independent variable, while a non-centered variable indicate the effect of that variable on Y when the value of the other independent variable is zero (see, for example, Gelman 2006: 55). Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Table 5.3 shows that not the sovereignty declarations as such but rather a region's ethnic and religious composition determines the allocation of transfers. The variable of sovereignty declarations is only significant in Model 3, which additionally includes the proportion of other religions than Orthodox Christians, and its significance level is lower. The comparison between Model 1 and Model 2 indicates

[122] I ran the models with all cases yet the White test indicated heteroscedasticity of residuals among all of them.

that inclusion of the variable accountable for the sovereignty declarations adds only 0.8% to the variance explained by the variables of religion and ethnicity, and the interaction between them.[123] Furthermore, the probability of declaring the state sovereignty itself is pretty well explained only by a single variable – the proportion of non-Russians in the region's population (see Appendix E4). In fact, all 18 regions having more than 35% of non-Russians have declared state sovereignty and none of 33 regions declared sovereignty whose proportion of non-Russians was less than 9%.

It follows from the positive sign of the interaction term in Models 1 and 2 that religion and ethnicity mutually reinforce each other in determining transfers. Figure 5.3 depicts this interaction effect. We can see on the left plot that the effect of non-Russian population on the allocation of transfers is nearly absent among regions with 10th-percentile level of non-Christian Orthodox; the share of transfers in budgets of those regions vary around 30% regardless of their ethnic composition. To the contrary, ethnicity makes a crucial impact on transfers in the structure of budgets in regions with 90th-percentile level of non-Christian Orthodox: shifting from the 10th percentile of non-Russians to the 90th percentile increases the STB from 30.9% to 64.4%. However, this finding is rather theoretical. Due to high correlation between variables of ethnicity and religion we cannot find a region with large proportion of non-Christian Orthodox population and small proportion of non-Russians. It should rather be interpreted so as what would have happened if it had been possible in practice. At any rate, the interaction effect indicates that both factors should be present to take an advantage, a large proportion of non-Russians only or solely large percentage of non-Christian Orthodox do not add substantively to the region's share of transfers in the budget.[124]

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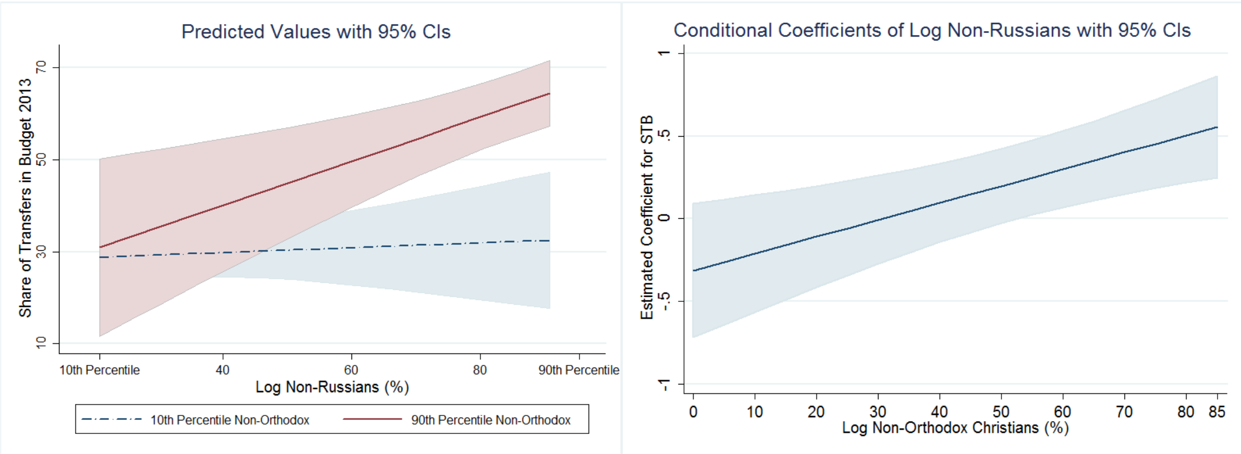
[123] However, when these variables are included in the full model they become insignificant. Therefore I did not use them in the main analysis until now and I oppose them here to their main alternative – the sovereignty declarations, but not to the full set of alternative predictors.

[124] Although there is virtually no Russian and at the same time *not* Christian Orthodox regions as well as Russians are typically absent in dominantly non-Christian Orthodox regions, there are several subjects of Russia whose scores on the non-Orthodox scale are much lower than on the non-Russian scale. These examples among the others include Chuvashia with 74% of not Russian population and only 7% of not the Christian Orthodox (on not log-transformed scales); Chukotka – 48% and 12%; Mordovia – 35% and 7%; and Karelia with 18% and 3% of non-Russian and non-Christian Orthodox population. The share of transfers in budgets of these regions only slightly deviate from the mean (41.5% among the recipients) or falls even below it: 35.2% in Chuvashia, 29.5% in Chukotka, 44.5% in Mordovia, and 27.5% in Karelia. That is much less than it might be expected if these regions were correspondingly non-Christian Orthodox.

Figure 5.3. The interaction effect between religion and ethnicity on predicting transfers



Note: Based on Model 2 in Table 5.3 with exception that variables are not centered. On the left plot, 10th and 90th percentiles equal 20.8, 95.5 for Non-Russians, and 35.7, 77.3 for Non-Orthodox, respectively. On the right plot, the effect of Non-Russians on the STB was estimated conditionally on the full range from the minimal through the maximal values of non-Orthodox Christians, i.e., [0: 86] percent.

However, by the nature of regression analysis the effects of ethnicity, religion, and the interaction between them are muted when all three variables are entered into the equation against the set of alternative explanations accounted for by single variables. To give the variables associated with ethno-religious concerns a more equal chance I construct an index of them, which is based on averaged unstandardized b-coefficients obtained from the set of thirteen regression models identical to Model 2 in Table 5.3 but including years 2000, 2001,... 2012. The results of regression analysis, however, appeared to be mixed and shown in Appendix E5 with more discussion. Generally speaking, it cannot be concluded that either ethno-religious concerns or electoral interests prevail. There is rather a combination of ethno-religious concerns' effect on the share of transfers in the budget mediated by the incumbent's vote with the main effect of ethno-religious concerns on transfers. Since the variables of religion and ethnicity are time constants due to absence of appropriate data for the defined periods and very small variability over time, they are not used in the multilevel analysis afterwards.

Multilevel Models to Examine the Determinants of Transfers

This section expands the scope of analysis beyond 2013. However, not only the effect of year but, as it was discussed in the prior section, the effect of budget type (i.e., whether a region is net recipient of federal transfers or net donor of federal taxes) should be regarded when the allocation of transfers is being explained. Thus, for the purposes of analysis the most appropriate appears to be a nested random effects model where observations are firstly grouped into years and type of regional budgets is then nested within years that formally suggests the following equation:[125]

$$T_{iyt} = (\beta_0 + \beta_{0yt}) + (\beta_1 + \beta_{1yt})x1_{iyt} + (\beta_2 + \beta_{2yt})x2_{iyt} \dots + (\beta_n + \beta_{nyt})xn_{iyt} + \varepsilon_{iyt},$$

where T_{iyt} refers to transfers received by *i*th region in year y with budget type *t*; β_0, β_1, β_2, and β_n denote respectively the fixed effects of the intercept and the set of explanatory variables ($x1$, $x2$,... xn); β_{0yt} denotes the intercept; β_{1yt}, β_{2yt},... β_{nyt} denote the slope random effects of budget type nested within year; and ε_{iyt} denotes the error term.[126]

I restrict the model to the most relevant variables. GRP is omitted so long as its effect on transfers is mediated by regional taxes. Time-constant variables are excluded as well. As in the previous models, the dependent variables include the

[125] Using only a random intercepts model equivalently as using dummies for groups of regions is substantively meaningless and misleading since not only intercepts but also coefficients are very much variable and often have opposite signs (see Figure 3 and Table E6 in Appendix E6).

[126] *Computation details*: models were estimated by using *glmmPQL* function in the R's package *MASS* that a fits generalized linear mixed model (GLMM) with multivariate normal random effects using Penalized Quasi-Likelihood and uses *nlme* as the underlying fitting engine. It appeared to be the only working function for fitting a multilevel model with a random term consisting of intercepts and coefficients varying by two groups and a pretty large number of variables. Two most widely used R's functions for multilevel analysis resulted in unresolvable problems related to fitting the full models. The function *lmer* in the package *lme4* produces unrealistically large standard errors, therefore making nearly all variables completely insignificant. The *nlme*'s function *lme* is more helpful in this regard, yet it comes up with problems of convergence when the number of parameters in the random term is large. Another alternative in R could be using a generalized additive mixed model (the *gamm* function in *mgcv* package) but it preforms even slower than the previous two functions. Computing random effects with Stata's *xtmixed* command in its turn comes up with two faults. On the one hand, using the independent (the default), exchangeable or identity variance-covariance structure of the random effects makes the convergence process easier but the random effects in this case become insufficiently variable (random coefficients diverge only slightly from the fixed effects). On the other hand, setting the unstructured variance-covariance structure of the random effects, which is presumably more suitable for the purposes of analysis, makes the convergence problem unresolvable for the full models. Even if a reduced model is successfully run, the output shows an error if random effects are requested.

data on the post-election years while all explanatory variables follow with a one year lag.[127]

Table 5.4. Multilevel models explaining the allocation of transfers in 2001–2013

Dependent Variable:	Share of Transfers in the Budget		Log Transfers Per Capita (RUB)[c]		Log Transfers (million RUB)[c]	
Fixed Effects	Full Model	Best Model	Full Model	Best Model	Full Model	Best Model
Constant	-9.255 (-.88)	-3.37 (-.33)	-17895* (-1.82)	-15517* (-1.8)	-11215** (-2.26)	-12352** (-2.14)
Log Population					4.8e-3*** (2.98)	6.1e-3*** (4.43)
Log Regional Taxes Per Capita[a,c]	-1.9e-4*** (-4.3)	-2.1e-4*** (-4.8)	.204*** (3.06)	.176*** (3.03)	6.5e-8* (1.91)	4.5e-8* (1.7)
Log Unemployment (%)	1.818*** (4.85)	1.724*** (5.0)	1466** (2.48)	1562** (2.49)	418.5* (1.8)	446.2** (2.21)
Population with Income Below the Living Minimum (%)	.625*** (3.17)	.553*** (3.09)	363.4** (2.48)	248.4* (1.87)	287.9*** (2.96)	262.98** (2.35)
Infrastructure Is More Developed	1.704 (1.57)		2422** (2.39)	2428** (2.42)	-26.3 (-.06)	
Infrastructure Is in Worse Condition	.394 (.46)		-194.4 (-.3)		-519.8 (-.68)	
Incumbent's Vote (%)	.215* (1.81)	.219** (2.38)	216.8** (2.19)	228.6** (2.42)	148.9** (2.34)	175.9*** (3.0)
Years Governor in Office	.282 (1.35)		68.67 (.42)		111.2 (.8)	
Terrorist Attacks [Attacked]	.45 (.2)		-556.1 (-.37)		9.4 (.01)	
Conflict Situation	4.181* (1.91)	3.336* (1.84)	494 (.27)		1960 (1.33)	
R-squared by random and (fixed) effects[d]	.669 (.191)	.608 (.241)	.434 (-1.05)	.351 (-.892)	.624 (-.177)	.543 (-.152)

Estimated RE coefficients for Incumbent's Vote[b]	Type	Year: 2001	2005	2009	2013
Share of Transfers in the Budget	Donor	.015	.106	.127	.06
	Recipient	.055	.244	.531	.615
Log Transfers Per Capita	Donor	-1.87	60.2	251.6	334.2
	Recipient	86.2	139.2	432.0	527.2
Log Transfers	Donor	75.5	103.2	295.2	190.1
	Recipient	87.8	124.3	305.7	225.3

Number of observations by Group	Group Variable	N of Groups	Observations per Group: Minimum	Avera-ge	Maximum
	Year	4	83	83.0	83
	Type	2	24	41.5	59
Total N of obs.			332		

[127] Insofar as the data on transfers are available on an annual basis, one alternative could be including all these years in the model by extrapolating election results between election years. However, due to high serial correlation of transfers (see Table 5.8) such a step would have been statistically and essentially imprudent.

Note: Entries are unstandardized coefficients with t-values in parentheses. Models fit by maximizing penalized quasi-likelihood (PQL) with general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. The random term consists of intercepts and each variable's slopes varying by Year and Type. The best models are defined by backward elimination. a. For the models with Log Transfers explanatory variable is present in its units of measurement (rubles) without dividing by population, the variable of population is included instead. b. Random effects coefficients obtained from the best models. See the full table of random effects in Appendix E6. c. Variables measured in rubles are in constant 2012 prices. d. To compare the models I use an analogue of R-squared, the proportion of variance explained, calculated between groups (R^2) and within groups (R^2_{yt}), measured in squared deviations by the following formulas: $R^2 = 1 - \left(\sum_{i=1}^{N} \varepsilon_i^2 \,/\, \sum_{i=1}^{N}(y_i - \bar{y})^2\right)$ and $R^2_{yt} = \left(\sum_1^8 \left(1 - \left(\sum_{i=1}^{nyt} \varepsilon_{iyt}^2 \,/\, \sum_{i=1}^{nyt}(y_{iyt} - \bar{y}_{yt})^2\right)\right) \times n_{yt}\right)/N$, where ε_i refers to the model's fixed effects residuals, y_i to the dependent variable, $\bar{y}$ to the dependent variable's grand mean, and N refers to the total number of observations; for the within-group formula, these indicators are grouped by budget type t nested within year y. That is, n_{yt} is the number of observations, y_{iyt} and $\bar{y}_{yt}$ are the dependent variable and its mean in ith region in year y with budget type t, whereas ε_{iyt} denotes random effects residuals. That is, R^2_{yt} is the average of all eight groups' R-squared weighted by the size of each group. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The fixed effects presented in Table 5.4 are generally consistent with findings of the preliminary analysis. The allocation of central transfers is determined by a combination of electoral concerns and regional needs. The effect of the incumbent's vote is positive and significant in all models. If all other variables are fixed at their means, a shift of the incumbent's vote from the 5th percentile (54.1%) to the 95th percentile (86.2%), according to the Share of Transfers in the Budget model, translates into a 7.1% increase in the STB from 28.6% to 35.7%. The corresponding change in the incumbent's vote also results into a 7,336.3 ruble growth in per capita transfers and yields an additional 5.6 billion rubles of transfers to the regional budget.

The effect of regional taxes between several models is troublesome: it is negative in the STB model but unexpectedly positive in two other models. Under otherwise equal conditions, the STB model estimates that the share of transfers in the budget should decrease by 14.2% if the level of per capita taxes increases from the 5th to the 95th percentile. To the contrary, the Log Transfers Per Capita model predicts that regions with 95th-percentile level of taxes levied to their budgets are granted 11,812.4 rubles more in per capita transfers than their 5th-percentile level counterparts as well as the Log Transfers model determines that the most self-sufficient regions received 7.1 billion rubles more from the federal center than regions with the lowest own tax revenue. Nevertheless, this positive relationship should be viewed with caution since it is not robust to different model specifications and appears only when other variables are controlled for. If choosing between the

STB and the two other models, the first one should be preferred to due to its higher reliability.[128] The two other models, at the same time, show that not everything is clear with the equalizing explanation of federal transfers.

Among the indicators of regional social need, unemployment and the share of people with income below the living minimum have expected and consistent effect between all models, while the indices of infrastructure are not consistently significant. All else being equal, shifting the level of unemployment from the 5th percentile (8.9%) to the 95th percentile (19.2%) increases the STB by 17.8% from 23.6% to 41.4%. Analogously, it creates an advantage of 16,163.6 rubles in per capita transfers and 4.6 billion rubles of transfers in budget. As the share of population with income below the living minimum grows from the 5th (13.0%) to the 95th percentile (40.4%), the share of transfers in the budget is correspondingly getting larger by 15.2% from 24.9% to 40.1%. It also leads to a 6,806.3 ruble increase in per capita transfers and to a disbursement that contributes 7.2 billion rubles more to the budget of regions with high proportion of the destitute people. These results, however, are not as optimistic to the ordinary citizens as it may seem. Even though regions with high levels of unemployed and destitute people are

[128] To examine possible reasons of the difference in the effect of regional taxes on transfers measured by three alternative variables I ran several auxiliary multilevel models: 1. regional taxes are a single predictor of transfers, coefficients vary by year and type; 2. regional taxes are a single predictor of transfers, coefficients vary only by year; 3. based on the best model, all variables' coefficients vary only by year; 4. based on the best model, coefficients of regional taxes vary only by year, while other variables' coefficients vary by year and type. The fixed effects of regional taxes on the STB were negative and significant in all these models. The STB model is therefore the most reliable. The effect of regional taxes was much more vulnerable to presence of other variables and level specification in models using two alternative variables of transfers In the Log Transfers Per Capita model, regional taxes demonstrated no effect on transfers in specification 1 (t-value = 0.73), significant and negative effect in specification 2 (t = -3.1), and positive effects in the best model specifications 3 (t = 2.54) and 4 (t = 2.92). In a similar controversy regional taxes showed negative and significant effects in specifications 1 (t = -2.21) and 2 (t = -4.33) but not significant effects in specifications 3 (t = -0.04) and 4 (t = 1.59) of the Log Transfers model. Hence, regional taxes change the sign of its (rather negative) effect on transfers under the influence of other variables in the equation. I also ran the best models without the variable of regional taxes. The results appeared to be similar to those presented in Table 5.4, with exception that unemployment was insignificant in the Log Transfers Per Capita and Log Transfers models. The negative fixed-effects R-squared in the Log Transfers and Log Transfers Per Capita models also results chiefly from the biased coefficients of regional taxes: if the real relationship is negative yet the estimated effect is positive then the grand mean is a much better predictor than the estimate.

Another oddity with regional taxes comes from the fact that this variable is the prime contributor to the heteroscedasticity of models' residuals. I applied an analogue of the White test for heteroscedasticity of residuals to the multilevel models. On the left-hand side of the equation was located the model's residual term and the same multilevel model's specification from the right-hand side was located on the right. The variable of regional taxes was strongly significant in all model specifications, yet to a smaller degree in the STB models. In other words, errors tend to be larger as the level or regional taxes increases. I tried using a ranked variable of regional taxes but it did not mitigate this problem. Finally, I decided not to exclude the variable from analysis since it is associated with one of the most influential explanations but I recommend viewing the positive effects of regional taxes on transfers appearing in the Log Transfers Per Capita and Log Transfers models with some reasonable degree of scepticism. At any rate, the best STB model has generally passed the analogue of White test (see Appendix E6 on postestimation of the multilevel models).

actually provided with more federal aid, transfers being received from the center are not necessarily used by regional authorities for the purposes of alleviating social needs. I show later in Chapter 6 that the federal remittances in transfers-dependent regions are largely consumed by bloated state bureaucracy.

Some support for political appeasement strategy is found only in the STB model. The presence of conflict situation[129] is positively related to transfers: regions with ongoing ethnic conflicts dispose 3.3 percent more transfers in their budgets than regions with a stable situation. Nevertheless, this finding is not supported by other models and, similarly to the significance of infrastructure development in the Transfers Per Capita model only, can be attributed to eventuality. Terrorist attacks and governor's tenure in office appear to be insignificant at all.

The aforementioned marginal effects at means may seem relatively small. Nevertheless, there are only effects of single variables. In practice regions whose share of transfers in the budget exceeds 50% typically combine poor economies with ostensibly loyal polities. Their high levels of the STB are therefore predicted by the effects of several variables simultaneously. It should be also underlined that the calculated marginal effects represent only rough approximations taken on average between all years and budget types. Precise predictions in multilevel modeling are based on random effects.

As follows from the random effects of the incumbent's vote presented in the lower panel of Table 5.4, the difference between donor and recipient regions is crucially important. In the best model with the STB as the dependent variable, the average coefficient for recipients is nearly five times larger than for donors.[130] This difference is considerable in the Log Transfers Per Capita model: recipients' coefficients are 1.8 times larger on average. The difference is, however, less pronounced in the Log Transfers model where the averaged recipients' coefficients

[129] It may be asserted that splitting the dataset on donors and recipients crucially affects the distribution of dummy variables so that, for instance, the number of regions with a conflict situation is larger in the recipient regions therefore the relationship between transfers and civil conflicts exist within the whole range of regions but it does not exist within the groups of regions defined by the budget type. Hence, the relationship may be artificially suppressed by splitting the dataset. I ran models with random terms varying only by year and did not find evidence in favor of this assertion. The dummy variables as well as the other predictors followed similar patterns to those that observed in models of Table 5.4. Nevertheless, two noticeable differences include the following: the index of development of the regional infrastructure was significant in the full and reduced models with the STB as the dependent variable; in the model with Log Transfers, population was about one third as more significant, leading to a decrease in t-values of the regional taxes and unemployment to insignificant levels. The incumbent's vote was significant in all models.

[130] Calculated as the ratio of coefficients: (0.055 + 0.244 + 0.531 + 0.615) / (0.015 + 0.106 + 0.127 + 0.06) = 4.69. The ratio is calculated analogously for the other models.

exceeded the donors' coefficients by 1.2 times. It should be noted that this inherent bias in favor of the recipients is attributed only to the incumbent's vote. As appears in the full table of random effects (see Table E7 in Appendix E6), coefficients of any other variable are not prone to be systematically larger or smaller between two groups of the budget type.[131] This finding proves that federal officials indeed treat donor and recipient regions differently. At the same time, the random effects show that the relationship between the incumbent's vote and transfers is getting stronger over time. One-percent increase in the incumbent's vote increases the STB by merely 0.06 percent in 2001, then, the effect strengthens to 0.24 in 2005, 0.53 in 2009, and 0.62 in 2013 among the recipients. A similar tendency is observed when per capita transfers are used as the dependent variable; transfers controlled for population show a perceptible but not strong decline of the increasing trend in 2013. In other words, electoral interests in the process of allocation of transfers are beginning to play a more prominent role as authoritarianism progresses over time.

Taking Time into Account

The bulk of the literature is focused on cross-sectional variation in intergovernmental transfers, controlling for time trends or including dummy variables for years to account for temporal fixed effects. Meanwhile, the hypothesis about tactical distribution (Dixit and Londregan 1996) stipulates that the *change* in levels of political indicators determines the *change* in levels of public finances in specific territories. However, in those rare cases when dynamic models have been tested by scholars, the effects of political variables appeared to be either small or controversial.

In his pioneering study, Wright (1974) regressed the change of the Democratic vote on the change of the federal New Deal spending, other forms of the federal aid, and a set of control variables. He found only a modest effect of the federal spending on the vote. In particular, the variable of changes in spending was at all insignificant; changes in work relief programs were negatively associated with the Democratic vote. Likewise, Ansolabehere et al. (2002) found that changes in the relative (legislative) representation index (RRI) from 1960 to 1980 accounted for growth of changes in per capita intergovernmental transfers at county level in the

[131] The only exception of this kind is regional taxes, yet the ratio of average coefficients is dependent on the model. In the STB model, the donors' coefficients are 1.4 times larger than the recipient's coefficients. The donors' coefficients are however 1.2 and 4.5 times smaller in the Log Transfers Per Capita and Log Transfers models, respectively. Other variables' coefficients vary by donors and recipients almost at random.

United States, even though the effect in the dynamic model was twice as weak (R-squared in bivariate model = 0.16) as in the cross-sectional model (0.33).

At the same time, when the analysis was done at the state level with using the mean, the standard deviation, and the range of the RRI, the effects of changes in the state-level derivatives of the RRI on change in transfers per capita did not reach conventional levels of statistical significance. Examining the patterns of government expenditures in Tanzanian districts Weinstein (2011) uncovered that the ruling Chama Cha Mapinduzu targeted expenditures toward the districts with the largest margin for victory the party. Although this finding was consistent between two major models using per capita expenditures and change in per capita expenditures, the explanatory power of the model of levels (R-squared = 0.665) considerably overweighed the explanatory power of the model of changes (R-squared = 0.14).

This may happen for at least two reasons. First, self-interested politicians do unlikely calculate small-percentage differences in vote shares between constituencies with diligence. Rather they respond to considerable changes, for instance, when a stronghold constituency attempts to defect to the opposition or vice versa. However, such landslide changes rarely happen in practice.[132] Second, politicians with a strong and stable constituency may prefer to distribute disposable resources strategically, but not tactically, by having elaborated such rules of distribution that would permanently benefit their constituency regardless of periodical fluctuations in the vote.[133]

In this section, I test the hypothesis on tactical distribution of the central grants by dynamic modeling of the changes in transfers over time periods in order to verify whether transfers were allocated tactically or strategically throughout 2000–2016. Variables of changes, however, create several intrinsic problems. First, since the electoral data follow with four-year periods, other variables have to be averaged in

[132] The statistical result of this is that a plenty of small insignificant variations overweight few but important changes when a continuous dependent variable is applied in regression. Multinomial logistic regression in which the dependent variable takes value zero for all small variations up to some threshold, one – if the incumbent loses votes dramatically, and two – if support of the incumbent increases strikingly in the area might be useful in this case. However, my data shows that there is no outliers systematically scattered in favor of this suggestion. If outliers exist, they are scattered at random.

[133] Dixit and Londregan (1996) differentiate between grand or programmatic redistribution and tactical redistribution also labelled as “pork barrel”. The former is associated with long-term redistributive programs and the general social welfare systems, which change only when major ideological shifts occur. To the contrary, tactical redistribution “goes on continuously even while a given policy of grand redistribution remains unchanged” (p. 1133). Since long-term redistributive patterns can be not only programmatic but also (and in authoritarian regimes more frequently) clientelist, I prefer contrasting short-term tactical redistribution to long-term strategic redistribution.

the corresponding periods so that changes would reflect not occasional year-to-year fluctuations but four-year trends. This problem is complicated by the need of duly measuring the variables having a temporal trend.[134] For the dependent variable, I handle these difficulties by employing the share of total transfers percent change (STTPC), i.e., the share of each region's transfers in the total national amount of transfers. The share of total transfers (STT) is preferred to the STB so long as the STB is dependent on the size of regional budget that is variable from year to year. Besides that, the STT is stationary over time. The indicator of transfers is then averaged within four-year periods by using unstandardized b-coefficients from OLS models that regress the STT on time in each region, where years are substituted by values 1, 2, 3, and 4. Thereby the average annual change (AAC) is obtained. I use this kind of indicator for all variables having annual observations. Moreover, the size of transfers and regional taxes is strongly dependent on population. But instead of using per capita terms, which leads to a bias that was discussed earlier, I rely on percentage change (PC) in transfers and regional taxes predicted by the AAC over the median value of the first year (y) of the period and two adjacent years (y - 1 and y + 1), so that:[135]

$$STTPC = \left(\frac{AAC \times 4}{median\left(STT_{y-1};\ STT_y;\ STT_{y+1}\right)}\right) \times 100.$$

Second, in the dataset, several variables of changes have multiple strong outliers. I solve this problem by ranking these variables. The ranked variable is created as follows: the minimal value is assigned rank 1, the next value is assigned rank 2..., and the maximal value is assigned rank 83. The ranked variable is essentially a discrete ordinal variable where each next individual value (i + 1) is bigger than the preceding one (i) but the difference between them is not necessarily equal to the difference between other adjacent values in the range. The remaining variables are not ranked because their distributions do not include outliers and are not skewed.[136]

Once variables are defined for analysis, a proper type of dynamic model should be chosen. One approach could be to use changes in the dependent variable at time t being explained by concurrent changes in predictors. Yet this widely-used

[134] Transfer money and regional taxes are naturally exposed to this bias due to their growth over time or inflation as well as other non-stationary variables. When four-year regional averages are calculated based on a variable with a growing national average, more weight is attributed to years with a higher national average.

[135] Regional Taxes Percent Change is calculated analogously.

[136] Ranking all variables in the model produces very similar results to those presented below.

approach has a shortcoming related to causality. A causally determined relationship ordinarily implies a change in the predictor variable that translates into response of the dependent variable occurring with some lag.[137] Indeed, if an effect of the vote on transfers is presumed, change in the vote should occur prior to change in transfers. Likewise the other variables: changes in social and economic conditions should precede the amendments in allocation of transfer money. Hence, a dynamic model with lagged set of independent variables makes a claim to more appropriately address causal relationships. The causality issue is broad in fact, since the relationship between transfers and the incumbent's vote may go in both directions. Appendix E7 examines this issue by applying the Granger causality test and shows the evidence that the influence of the incumbent's vote on the allocation of transfers is much more probable though bilateral causality cannot be rejected with absolute certainty. Thus, the dynamic model of changes is specified as follows:[138]

$$\Delta Y_t = \beta_0 + \beta_1 \Delta x1_{t-1} + \beta_2 \Delta x2_{t-1} \ldots + \beta_n \Delta xn_{t-1} + \varepsilon_t,$$

where ΔY_t refers to the STTPC; β_0, β_1, β_2, and β_n denote the intercept and the slopes the set of differenced explanatory variables ($\Delta x1$, $\Delta x2$,... Δxn) that follow with one temporal lag of four years ($t-1$), and ε_t denotes the error term.

The results of the dynamic models are presented in Table 5.5. The general finding is that no variable is significant across all models. The lagged variable of changes turned out to be significant in only two periods – 2004–2008 and 2012–2016. Since the dependent variable and its lag are measured in the same units, it may be asserted that 21 and 27 percent of changes (Model 2 and 6, respectively) were of volatile nature: if the share of total transfers increased in a region by some value, it about twenty percent as probable to correspondingly decrease in the next period or it correspondingly increase if it decreased before. The effect of the incumbent's vote is controversial. It is negative in the first period: shifting from the 5th percentile of changes in the vote between 2000 and 2004 (4.5%) to the 95th percentile (31.8%) translates into decrease in the share of total transfers percent

[137] In reality, however, many causally dependent processes come almost concurrently. Wheels, for instance, instantly follow the road's surface when a vehicle is moving until the moment when an obstacle that cannot be handled by the suspension is met. Due to this reason I ran models analogous to those in Table 5.5 but without a lag. The results revealed fewer significant effects and a smaller proportion of explained variance by the models. This indicates that variables, which appeared to be significant in Table 5.5, are casually determined rather than simply correlated.

[138] Even though the data are not time-series, I call the model "dynamic", i.e., examining the process over time, as opposed to static models, which do not take time into consideration.

change by 22.6 ranks (Model 2). Just the opposite effect is produced by analogous shifting from the smaller (-9.3%) to the larger (10.7%) changes of the vote in the period of 2004–2008: the STTPC increases by 24.6 ranks (Model 4). The variable of changes in the incumbent's vote appeared to be insignificant in the next period.

Changes in transfers in the period of 2004–2008 were also well determined by two variables of social need. The marginal growth in the proportion of destitute people and in development of regional infrastructure correspondingly account for 21.2-rank growth and 19.1-rank decline in the STTPC (Model 2). One variable of social need is also significant in the last period: the marginal change in transfers between 2012 and 2016 constituted 20.3 ranks in those regions whose infrastructure condition improved in 2008–2012. Although the variable of regional taxes performed well in cross-sectional analysis of levels, changes in regional taxes appeared only marginally significant in the period of 2004–2008, and its marginal effect amounted to 12.9-rank change in transfers. Generally speaking, changes in transfers between 2004 and 2008 were determined by social needs, the changes between 2008 and 2012 were primarily determined by electoral interests, and the changes in the last period between 2012 and 2016 rather occurred due to contingent factors.

Table 5.5. The dynamic OLS models to explain the ranked changes in transfers over time periods

DV: Share of Total Transfers Percent Change, Ranked	2004–2008		2008–2012		2012–2016	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	65.92*** (6.27)	61.9*** (6.17)	42.45*** (5.06)	36.51*** (7.2)	59.19*** (6.34)	53.38*** (10.61)
$STTPC_{t-1}$, Ranked	-.195** (-2.1)	-.212 (-2.33)**	-.172 (-1.62)		-.309*** (-2.85)	-.271** (-2.61)
Δ Incumbent's Vote $(\%)_{t-1}$	-.929*** (3.16)	-.088*** (-3.05)	1.23*** (2.8)	1.31*** (3.04)	.205 (.44)	
Regional Taxes Percent $Change_{t-1}^{a}$	-.161* (-1.68)	-.17* (-1.74)	-.047 (-.47)		-.17 (-1.01)	
Unemployment AAC_{t-1}, Ranked	-.119 (-1.25)		.16 (1.5)	.176* (1.67)	.019 (.17)	
Population with Income Below the Living Minimum AAC_{t-1}, Ranked	.301*** (3.07)	.28*** (2.92)	.072 (.66)		-.078 (-.69)	
Δ Infrastructure More $Developed_{t-1}$	-24.91** (-2.43)	-22.95** (-2.27)	-8.63 (-1.17)		-9.92 (-1.61)	
Δ Infrastructure in Worse $Condition_{t-1}$	1.81 (.48)		-2.66 (-.5)		8.08* (1.73)	10.47** (2.39)
R-squared	.404	.40	.175	.123	.177	.135
White heteroscedasticity test	.105	.029	.326	.088	.235	.584
N	83	83	83	83	83	83

Note: All predictors follow with four-year lag relatively to the dependent variable, i.e., the incumbent's vote change in 2000–2004 corresponds to change of the STTPC in 2004–2008. Variables marked by the delta do not have intermediate values within the typical four-year period; they correspond to a mere difference between two years. a. The variable of regional taxes is ranked only for the period of 2000–2004 when it has several strong outliers. Entries are unstandardized coefficients with t-values in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

While the previous models answer the question how changes in predictor variables affect changes in transfers, the next question that appears is at what levels of other variables the changes in transfers more likely to occur. A semi-dynamic model is designed to answer this question. It is based on the following similar equation that also includes changes in transfers on the left-hand side but includes levels instead changes on its right-hand side:

$$\Delta Y_t = \beta_0 + \beta_1 x1_{t-1} + \beta_2 x2_{t-1} \dots + \beta_n xn_{t-1} + \varepsilon_t.$$

The results appear in Table 5.6. The first notable finding from the best models is that the level of transfers measured as the share of transfers in the budget significantly and negatively influences the changes in transfers. On the one hand, the STB approaches some natural threshold in regions that heavily dependent on the federal remittances thereby slowing down and deterring the subsequent growth of transfers. On the other hand, in conjunction with some degree of volatility in transfers indicated by the previous models the negative coefficients of the STB imply that transfers after a temporary increase are ordinarily amended downwards.

Although all other variables have expected signs, none of them is systematically significant throughout all models. The level of the incumbent's vote is positive and strong predictor of the changes in transfers only in the period of 2008–2012. If we travelled in 2008 from one of the regions less supportive of Medvedev (the 5th percentile (61.8%) or the level of Ryazan Oblast) to one of the most supportive regions (the 95th percentile (90.6%) or the level of Karachay-Cherkess Republic) we might expect that the difference in the STTPC between them will amount 35.4 ranks in the four subsequent years. All else being equal, Ryazan Oblast would have to receive 15.1% fewer transfers (30.9 rank of the STTPC) while Karachay-Cherkess Republic would be donated 19.5% more transfers (66.3 rank of the STTPC). The set of explanatory variables additionally includes population. The hypothesis behind this variable is that self-interested officials may be motivated in nipping off small imperceptible bits of transfers from large regions to distribute them to small regions for which these portions are more valuable. This variable is, however, only marginally significant in the best model of the STTPC in 2000–2004.

Table 5.6. The semi-dynamic OLS models to explain the ranked changes in transfers over time periods

DV: Share of Total Transfers Percent Change, Ranked	Full Models			
	2000–2004	2004–2008	2008–2012	2012–2016
Constant	72.92* (1.68)	77.47** (2.11)	26.23 (.54)	85.41* (1.76)
STB (%)	-.591*** (-2.94)	-1.11*** (-6.29)	-.795*** (-2.91)	-.397 (-1.19)
Incumbent's Vote (%)	-.158 (.59)	.091 (.38)	1.44*** (4.15)	-.234 (-.61)
Log Regional Taxes Per Capita (RUB)	-.0003 (-1.51)	-.0001 (-.68)	-.0003 (-1.58)	-.0004 (-1.56)
Log Unemployment (%)	1.18 (.81)	-.425 (-.46)	-2.23 (-1.41)	2.62 (1.05)
Population with Income Below the Living Minimum (%)	.218 (.78)	.358 (1.26)	.9 (1.29)	-.57 (-.63)
Infrastructure Is More Developed	-2.99 (-.92)	-4.83* (-1.72)	-1.78 (-.56)	-.76 (-1.09)
Infrastructure Is in Worse Condition	-.57 (-.2)	1.55 (.8)	-2.85 (-1.07)	5.05* (1.75)
Log Population	-2.6e-6 (-1.45)	-1.5e-6 (-1.04)	-3.9e-6* (-1.96)	-3.7e-7 (-.17)
R-squared	.183	.562	.251	.157
White heteroscedasticity test	.31	.035	.405	.031
	Best Models			
Constant	101.49*** (5.34)	52.73*** (10.06)	-33.1 (1.52)	85.24 (4.59)
STB (%)	-.479*** (-2.83)	-.933*** (-8.43)	-.361** (-2.62)	-.36* (-1.83)
Incumbent's Vote (%)			1.23*** (3.74)	
Log Regional Taxes Per Capita (RUB)	-.0004** (-2.56)			-.0005** (-2.36)
Population with Income Below the Living Minimum (%)		.442* (1.87)		
Infrastructure Is More Developed	-5.51** (-2.1)			
Infrastructure Is in Worse Condition				5.4** (2.1)
Log Population	-3.1e-6* (-1.98)			
R-squared	.166	.537	.16	.114
White heteroscedasticity test	.123	.031	.351	.01
N	83	83	83	83

Note: All predictor variables correspond to the initial years of the periods. For instance, the STTPC 2000–2004 is determined by the STB 2000. Entries are unstandardized coefficients with t-values indicated in parentheses. H0 for White test: residuals are homoscedastic. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

To summarize the results of the dynamic and semi-dynamic models, the explanatory power of all models is expectedly smaller if compared with cross-sectional models and fewer variables turned out to be significant. However, we cannot infer from these models that political interests and politically-neutral motivations play no causal or tactical role at all in the politics of allocation of transfers. The models rather show that minor adjustments determined by these reasons occur in the regional shares of transfers on a time-to-time basis, while the general pattern of allocation is established and it is not subject to radical transformations. Thus, we can reject the hypothesis about tactical distribution and accept that the pattern of distribution is strategic. The remaining question is in what sequence and why this pattern appeared or how the regime's clientelist coalition has been forged in the nascent Putin's autocracy of the early 2000s.

From Tactical Opponents to Regime Supporters: the Trajectory of Political Transformation of the Ethnic Regions in the Early 2000s

During the 2000s, we may observe a stable incumbent's constituency composed of ethnic republics, especially in the North Caucasus, that persistently votes (or falsifies votes) for Putin and systematically receives larger federal transfers. However, the very same group of regions had been in opposition to the central government during the 1990s under Yeltsin's rule. The literature on distributive politics gives us an answer why the ethnic regions received larger transfers in the 1990s (they were politically appeased thereby (Treisman 1998a)) and why they were also privileged in the 2000s (were rewarded for support (Cox and McCubbins 1986)), yet existing theories do not allow to account for the *change* that occurred in Russian transfer politics in the early 2000s when Putin came to power. In particular, why did the regime make a decision to deliver benefits for the group of non-Russian regions in the early 2000s; they were in opposition to the federal center, which set a course for political recentralization? And why did these confrontational regions change their strategy toward the federal center from opposition to loyalty? This section endeavors to answer these questions by offering an extension to Cox and McCubbins's (1986) theory and arguing that a candidate's strategy toward a group of the electorate depends not only on the level of electoral support by this group but also on issue salience and issue positioning of the group relatively to the candidate.

Basically, there are two obstacles to understanding the transformation of Russian federal-regional relations in general and distributive politics in particular that took place in the early 2000s. First, a high level of candidate's share of the vote is ordinarily used as a proxy to core supporters (Ansolabehere and Snyder 2006; Martin 2003; Weinstein 2011), and a small difference in vote shares (closeness) between first two candidates is considered as an indicator of swing voters (Berry et al. 2010; Veiga and Pinho 2007; an exception is Dahlberg and Johansson 2002). This operationalization assumes a direct relationship between voter preferences and voting results, and therefore neglects strategic voting and other non-preference-based (i.e., tactical) types of electoral behavior. Drawing upon this approach, we shod classify the separatist ethnic regions, which voted against Yeltsin and pro-government parties, declared state sovereignty and implemented other secessionist policies in the 1990s, as core opponents of the incumbent. Thereby we encounter with no theoretical ground for converting this group into a support group since opposition groups are hardly paid any attention by self-interested candidates in both models by Cox and McCubbins (1986) and Lindbeck and Weibull (1987).

Second and interrelated with the first, speaking about "core and other supporters", Cox and McCubbins (1986: 379) do not define explicitly "other" support groups and do not differentiate them from core supporters. However, voters may support their candidates not only based on their ideological affinity on policy position issues but also due to more tactical concerns, such as delivering general wealth (economic voting) or particularistic goods (patronage voting), the entrenchment of law and order, and other concerns that generally pertain to valence issues as they are defined by Stokes (1963). Put otherwise, core supporters' support originates from proximity with their candidates on policy position issues, while position issues are rather non-salient for tactical supporters and their support originates primarily from positive evaluation of their candidates on valence issues.[139]

[139] This statement goes contrary to Dixit and Londregan (1996: 1134) who assert that "[a] party's core constituencies need not prefer its issue position. It is the party's advantage over its competitors at swaying voters in a group with offers of particularistic benefits that makes the group core". This assertion is rather counter-factual. Even a party's advantage in delivering benefits would yield smaller electoral returns in case of investment in the opposition's ideological supporters compared with ideologically unattached swing voters or ideologically proximate core voters. For example, consider a case of raising pensions by the incumbent government of Yeltsin. In this case, the incumbent has an advantage over the opposition since only government can raise pensions. If pensioners do not prefer the incumbent's issue position (assume that they are uniformly communists), then their responsiveness to the delivered benefits in the form of higher pensions will be obviously lesser than in the case when pensioners are ideologically moderate or liberal. A party's advantage in the access to its constituency (as any advantage) enhances chances for obtaining support among

Table 5.7. The types of electoral constituencies

	Group of Electorate				
Previous Electoral Behavior	Support		Swing	Opposition	
Issue Proximity – Non-Salience – Remoteness	Core	Tactical	Tactical	Tactical	Core

Relying on this approach to definition of core and tactical supporters, Table 5.7 classifies various groups of the electorate, including opposition groups. Following Cox and McCubbins (1986: 376), I define support, swing, and opposition groups depending on their previous electoral behavior: support groups are those who consistently supported the candidate in the past, swing groups have been neither consistently supportive nor consistently hostile, and opposition groups have consistently opposed in the previous elections. A key distinction suggested in Table 5.7 is that support and opposition groups are divided into core and tactical subgroups. Core supporters as well as core opponents are strongly motivated by ideological commitments. They support their candidates due to proximity on salient position issues. As maximum, the utility of consumption and the salience of other valence issues are as high for them as the salience of position issues, yet for the most of core supporters position issues prevail over valence issues. For the tactical groups, main policy position issues are not salient. They support candidates or oppose them according to their assessments of the candidates on valence issues. Swing voters are by definition unattached. Position issues are not salient for them and their assessments of different candidates on valence issues are roughly the same that makes them hesitant in choosing between two leading candidates.[140]

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this group but does not convert supporters (all the more opponents) from this group into core supporters. Cox and McCubbins (1986: 378) are even more sceptical regarding the successfulness of distributive politics when voters do not prefer a candidate's issue position (if they are ideological opponents): "[w]ould conservative groups in Massachusetts respond as much as would liberal groups to benefits – even actually delivered benefits – that came their way through Ted Kennedy's good offices? Possibly, but it seems more likely that they would just chalk these benefits up to imperfections in Kennedy's control of policy, which had not allowed him fine enough control over the distribution of benefits to exclude them".

[140] There is unlikely that swing voters take moderate positions on position issues. There is more plausible that these issues are not salient for them inasmuch as there is problematic (if impossible at all) to take a position in the middle between two important contrast and mutually exclusive alternatives. Such alternatives as to build capitalism or communism, communism or fascism, and whether to participate in a war or not. These alternatives are not discussed from election to election in normal times though. Keeping a central position on relatively unimportant (non-salient) and not mutually exclusive (allowing for a balance between the alternatives) issues is more typical. Such examples may include preferences concerning investment in healthcare or in the police, favoring public or private education, public or private roads construction, etc. Other

The main position issue in Russia in the 1990s was whether to continue radical liberal market reforms initiated by Yegor Gaidar, Anatoli Chubais, and other Yeltsin's appointees or to postpone these reforms, make them more gradual and socially-oriented as it was advocated by the Communist Party of the Russian Federation (KPRF) (McFaul 1997; Meleshkina 2000).[141] Nevertheless, this cleavage was rather of secondary importance in non-Russian and non-Christian Orthodox regions so long as the main impetus in the politics of these regions was ethnic separatism driven by concerns of strengthening regional elites' hold on power (Gorenburg 1999)[142] and instrumental benefits of separatist activism – lower central taxes and higher central transfers, rights over natural resources, freedom to export with fewer restrictions, etc. (Treisman 1997). In this connection, the ethnic regions have neither been KPRF's core supporters nor Yeltsin's core opponents. Elites of these regions opposed Yeltsin tactically for instrumental reasons of extracting more benefits from the federal center.[143] The absence of strong ideological commitments of the ethnic regions to the KPRF as the main opposition party had allowed Putin to convert these regions from tactical opponents into regime supporters by offering higher transfer payments in exchange for political loyalty. This offer as a positive stimulus or a "carrot", however, was supplemented with various "sticks" or

issues can be even more important and keeping a moderate position on them may seem reasonable for the majority of voters. For example, sharp inequality versus total equality or big business versus small business. Nevertheless, these issues are much less salient for swing (moderate) voters compared with those whose positions on these issues are determined ideologically or socially – the salience of social equality issue for socialists and the salience of privileges to small business for bakery owners, for instance. This approach, however, challenges common wisdom regarding the median voter. If position issues are assumed to be non-salient, it appears that the median voter is more indifferent toward position issues than moderate.

[141] In particular, McFaul (1997: 23) emphasizes the importance of capitalism – communism cleavage for Yeltsin's victory: "[t]o win [the election of 1996], Yeltsin and his campaign had to make this vote yet another referendum on communism. Voters had to understand (or be made to believe) that they were choosing between two systems, not two candidates". See McFaul (1997: Ch. 4) for Zyuganov's political program in the election of 1996. Apart from this, Meleshkina (2000: 188) shows that, out of those respondents who voted for Yeltsin in the second round of the 1996 presidential election, 87% were proponents of the course of economic reforms and 16% were opponents, whereas only 3% Zyuganov's voters supported the ongoing economic reforms and 55% of them were opponents to the reforms.

[142] Although Gorenburg (1999) challenges this commonly held belief and argues that the promotion of ethnic revival policies by republic officials was determined more by primordialist reasons "in order to ensure the group's collective survival" (p. 269) than by rational calculations, this argument does not exclude that "members of the titular political elite in each region sought to enact laws and adopt employment practices that would ensure that political power rested with members of their ethnic group" (p. 259). That is, by implementing ethnic revival policies, the ethnic elites strived to exclude Russians and members of other ethnic groups from the pool of potential competitors for power, even though publically they declared that their fight for sovereignty was aimed at enhancing economic development and producing other public goods, which should be distributed between all inhabitants, regardless of ethnicity.

[143] In the early 1990s, the ethnic regions were Yeltsin's tactical supporters. Yeltsin garnered their support in the result of a concession politics that can be summarized by his prominent phrase spoken in Kazan, the capital city of Tatarstan, in the fall of 1990: "take sovereignty as much as you can swallow". Nevertheless, when the process of acquisition of sovereignty went too far, Yeltsin began to undertake preventive actions (including bringing troops into Chechnya in December 1994) and lost his supporters represented by regional separatists.

enforcement measures applied to those who might have preferred to adhere to the politics of fiscal appeasement. These measures included denunciation of agreements between the federal center and the regions on the delimitation of powers, the second war in Chechnya – the most rebellious region during the 1990s, cancelling of gubernatorial elections in 2004 and replacement of those governors who could not demonstrate fine electoral performance of the "party of power" – United Russia – in their regions (Reuter and Robertson 2012), and other recentralization measures (Gelman 2006: 97–102).

To trace the major changes in the pattern of allocation of central transfers and in the incumbent's vote, recall that Putin's vote in 2000 does not explain the allocation of transfers in 2001 (see Table 5.4). It follows from Table 5.8 that it is also not helpful in predicting the share of transfers in regional budgets in any given year. There are only two statistically significant correlation coefficients in years 2007 and 2008, yet the proportion of explained variance in these cases is about 6% that is obviously too small to draw any conclusions. At the same time, the incumbent's vote of 2004 and the subsequent years explain roughly 30% of the STB's variance in all years except 2000 where it explains twice less – 14%.

Two points can be inferred from these facts. First, the spatial pattern of the incumbent's vote was crucially changed in 2004 and has remained relatively stable thereafter. Second, the allocation of the federal transfers has also undergone a considerable amendment in 2001 after the reform of 1999–2001, which introduced estimates of fiscal capacity and fiscal need for formula-based calculations of donations being transferred to regions (Jarocińska 2010: 408). Once amended, the allocation of transfers remained very slightly variable over time: the STB of 2001 and the subsequent years correlate at over 0.9 whereas the STB of 2000 correlate at approximately 0.7 with the STB of the all other years. The federal government, which is responsible for determining the principles of transfer allocation, could not know beforehand in 2001 the electoral outcome of 2004. Therefore, we may hardly suspect it of a deliberate attempt to manipulate transfers for electoral gain from a retrospective point of view. Nevertheless, since the allocation pattern was altered so that it became more correlated with the election results, we cannot exclude that central politicians granted more transfers to a sizable and stable constituency prospectively, hoping that this group will respond with loyalty in future. Accordingly, we cannot also discard the fact that the incumbent's vote transformed in 2004 so that it began to correlate with the STB of 2000 and all subsequent years. Thus, the change in the STB of 2001 and the change in Putin's vote of 2004 both contributed to the appearance of a correlation between these variables, though the causal mechanism of this change is still not obvious.

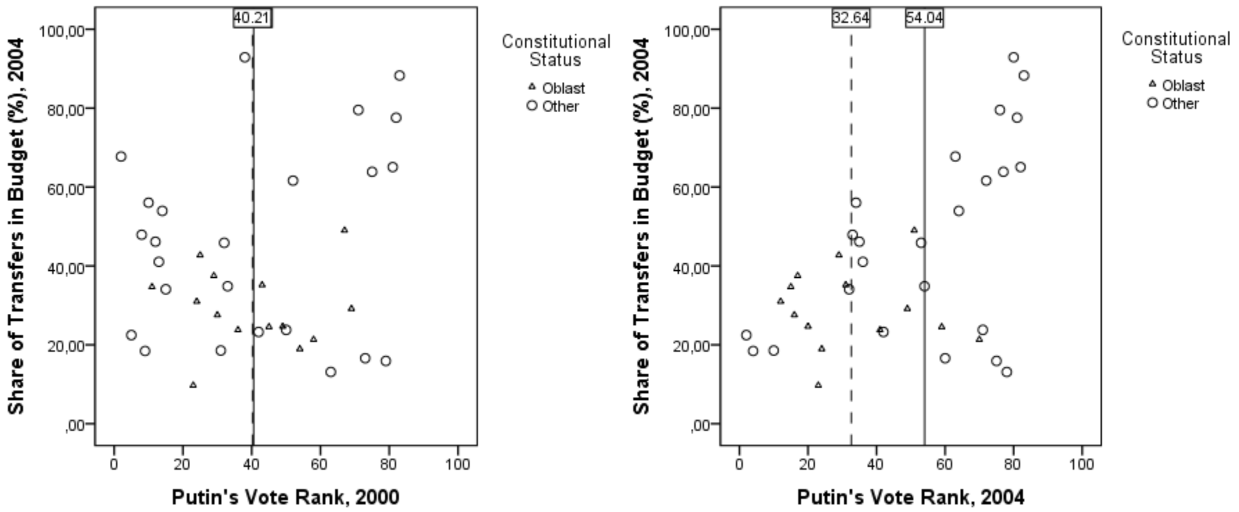
Table 5.8. The correlation matrix of the share of transfers in the budget and the incumbent's vote in various years

	STB 2000	STB 2001	STB 2002	STB 2003	STB 2004	STB 2005	STB 2006	STB 2007	STB 2008	STB 2009	STB 2010	STB 2011	STB 2012
Putin's Vote 2000	.14	.15	.18	.23	.20	.21	.23	.26*	.25*	.18	.21	.23	.23
Putin's Vote 2004	.39**	.56**	.56**	.58**	.59**	.58**	.63**	.64**	.63**	.57**	.61**	.60**	.60**
Medvedev's Vote 2008	.37**	.53**	.54**	.58**	.53**	.54**	.60**	.61**	.58**	.54**	.61**	.60**	.63**
Putin's Vote 2012	.39**	.61**	.58**	.60**	.60**	.60**	.65**	.65**	.64**	.60**	.65**	.63**	.67**
STB 2000	1	.77**	.77**	.75**	.70**	.74**	.76**	.74**	.72**	.69**	.68**	.70**	.70**
STB 2001	.77**	1	.97**	.95**	.93**	.95**	.95**	.93**	.93**	.89**	.80**	.90**	.88**
STB 2004	.70**	.93**	.94**	.97**	1	.97**	.93**	.90**	.91**	.90**	.91**	.91**	.91**
STB 2008	.72**	.93**	.92**	.90**	.91**	.95**	.98**	.99**	1	.95**	.93**	.94**	.920**
STB 2012	.70**	.88**	.91**	.91**	.91**	.93**	.93**	.90**	.92**	.93**	.96**	.98**	1

Note: The sample includes only regions that were net recipients of transfers at least once between 2000 and 2012; N=65. Entries are Pearson Correlation coefficients. Significant at: *p < 0.05, **p < 0.1.

Looking at regions with different constitutional status may help us to answer the question of why the distribution of Putin's vote in 2004 became more correspondent with the distribution of transfers. Figure 5.4 presents the incumbent's vote, which was ranked for a better comparability between 2000 and 2004, scattered against the share of transfers in budget of 2004. On the right plot, the ranked Putin's vote of 2004 explains 28% of the STB's 2004 variance while the vote of 2000 explains almost nothing, only 3% of the variance. The mean values of the rank Putin vote of 2000 were almost indistinguishable in *oblasts* with a predominantly Russian ethnic makeup and in the other regions with constitutionally assigned autonomies for various ethnic groups (40.21 and 40.54 percent). The mean Putin vote rank in *oblasts*, however, decreased by 7% in 2004, whereas the mean rank in the other regions increased by 14%. In other words, the ethnic autonomies became more supportive of Putin between 2000 and 2004 and their increased vote rates began to correspond to the higher levels of transfers in their direction.

Figure 5.4. How Putin's vote changed between 2000 and 2004 in regions with different constitutional status relatively to the allocation of transfers in 2004



Note: The dashed line is the mean rank of Putin's vote among regions constitutionally assigned the status of *Oblasts*; the solid line corresponds to the mean Putin's vote rank of all other subjects of the federation, i.e., *Republics, Autonomous Oblasts*, *Autonomous Okrugs*, and *Krais*. The sample includes only regions that were net recipients of transfers in 2004.

To examine the determinants of the change in a more systematic way I regress both the ranked Putin vote change of 2000–2004 and the ranked STB change of 2000–2001 on the levels of these variables, the Ethnoreligion Index[144], a dummy indicating whether the region is a republic or not (the latter two are indicators of ethnic and religious divergence with the cultural core of Russia), and on a set of control variables utilized in the analysis earlier. The neutrality hypothesis assumes no effect of ethno-religious concerns on the allocation of transfers. Similarly, an ethno-religious determination of the vote typically violates the democratic expectations. Results of the OLS models in Table 5.9, however, allow us to fully reject this hypothesis in relation to the incumbent's vote change. Besides the fully-specified Model 1, it presents the best model considering both – the Ethnoreligion Index and the republican status (Model 2) – and the best model only with the Ethnoreligion Index (Model 3). Both variables measuring constitutional and cultural deviation from central Russia are significant in all specifications. Model 2 shows that their explanatory power decreases by about a half when the variables are in

[144] See Appendix E5 on development of the index

the equation simultaneously indicating that they measure approximately the same phenomenon.[145]

Table 5.9. How the crucial changes in transfers and Putin's vote can be explained by various predictors: OLS models

	DV: Putin's Vote Change, Ranked, 2000–2004			DV: STB Change, Ranked, 2000–2001	
	Model 1	Model 2	Model 3	Model 5	Model 6
Constant	71.6*** (2.83)	94.1*** (8.01)	77.35*** (7.01)	85.4*** (2.89)	84.5*** (4.27)
Putin's Vote (%), 2000	-1.58*** (-8.17)	-1.62*** (9.0)	-1.56*** (-8.25)		
STB (%), 2000				-.932*** (-5.86)	-.878*** (-6.2)
Log Ethnoreligion Index	2.88* (1.91)	.339** (2.56)	.632*** (6.35)	-.14 (-.77)	
Republican Status	16.7*** (2.85)	17.5*** (3.17)		13.6* (1.89)	10.1** (2.05)
Log Regional Taxes Per Capita (RUB), 2000	1.1e-4 (.81)			-6.2e-4*** (-3.66)	-5.8e-4*** (-3.71)
Log Unemployment (%), 2000	.707 (.8)			.607 (.52)	
Population with Income Below the Living Minimum (%), 2000	.300* (1.68)	.253** (2.07)	.285** (2.21)	.556** (2.35)	.555** (2.41)
Infrastructure Is More Developed, 2000	-.119 (-.05)			1.32 (.45)	
Infrastructure Is in Worse Condition, 2000	-.763 (.41)			-2.63 (-1.13)	
R-squared	.614	.607	.557	.418	.403
White heteroscedasticity test	.663	.571	.209	.333	.336
N	83	83	83	83	83

Note: The variables of change firstly differenced and then ranked. The sample includes all cases; I found no considerable difference between donors and recipients in this regard. Entries are unstandardized coefficients with t-values in parentheses Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Inferring from Model 3, a one-point increase in the Ethnoreligion Index increases the Putin's vote difference between 2000 and 2004 by 0.63 ranks. Keeping other variables at their means, the shift from the 5th percentile on the Ethnoreligion scale (30.4, the level of Ivanovo Oblast) to the 95th percentile (94.7, the level of Kabardino-Balkar Republic) result in a change in Putin's vote from the rank 23.7 (12.75% in Saratov Oblast) to the rank 64.3 (23.0% in Samara Oblast). Putin's vote of 2000, which is used as a control variable in the model, has the expected negative sign and

[145] I also ran the best model but only with the variable of republican status. The variable's t-value was 6.71 that is very close to t-value of the Ethnoreligion Index in Model 3. These variables are statistically and essentially correlated but I use them both mainly for Models 5 and 6 where the Ethnoreligion Index appeared to be insignificant.

high t-values in all model specifications indicating that changes in the vote less likely occur at high levels of the vote: for very supportive regions becoming more supportive is not a simple task especially considering the 100-percent limit to the vote.

It is worth mentioning that almost none of the variables associated with economic conditions was statistically significant to be included in the best model. The proportion of people with income below the living minimum is one exception, yet its positive sign goes contrary to the conventional argument of the economic voting. We cannot conclude here with certainty whether the incumbent's vote change explained by the Ethnoreligion Index and by the proportion of people with small income came from the change in voters' preferences or it was caused by electoral fraud. But our predictors are rather favorable to the latter supposition: electoral manipulations are more widespread in the ethnic republics and the share of indigent people is generally larger in those areas.

The regional ethno-religious composition does not explain, however, the ranked change in the share of transfers in the budget between 2000 and 2001: the Ethnoreligion Index is not significant in the full and the best models. Yet the variable of republican status appears to be significant instead. Based on Model 6, the difference between republics and other regions amounts to 10.1 ranks of change in the STB between 2000 and 2001. Among the variables of social need the two appeared significant. The more extensive regional tax base resulted in a reduction in central remittances, while the larger proportions of destitute people a region had the more transfers it received as a result of the reform of 2000–2001. The STB 2000 is predictably the most significant variable having a negative sign: the magnitude of change in transfers is getting smaller as the level of transfers increases.

Thus, the impact of ethno-religious concerns on the incumbent's vote change between 2000 and 2004 was overwhelming and nearly unique among possible explanations. Meanwhile its effect on the change in the STB between 2000 and 2001 was less prominent but still distinguishable along with effects of the variables of social need. Therefore, not only are the federal transfers systematically distributed in favor of supportive groups rather than swing voters, as predicted by Cox and McCubbins (1986) theory, but the regime's most supportive group appears also to be bound by time-persistent ethno-religious identities and the regime was to some degree responsive to the demand of these supporters.

In the period of transition from the politics of fiscal appeasement to the politics of fiscal rewarding for political loyalty, central-level officials prospectively rewarded the group of non-Russian and non-Christian Orthodox regions (as the result of the fiscal reform of 1999–2001). In combination with other actions of political centralization (see: Gelman 2006: 97–102), this gave most rebellious regional elites a signal that loyalty to the federal center can yield more benefits in a newly established authoritarian system than manifestations of separatism or blatant defiance of federal laws. And elites of these regions accepted the offer by responding with various expressions of loyalty ranging from such symbolic measures as posting Putin's portraits in officials' offices to engaging their political machines in the process of "vote delivery" for the central incumbent.

Conclusion

This chapter has considered the determinants of the allocation of federal transfers to Russia's regions. It has provided evidence that, along with equity and efficiency principles, political interests played a considerable role in distributive politics in the period from 2000 to 2012. Specifically, regions with larger vote shares for the federal incumbent presidents were more generously granted with the central transfers. The effect of other political variables on the allocation of transfers was revealed only in year 2013 (governor's tenure in office) or insignificant (the number of United Russia's MPs). This finding is consistent with Cox and McCubbins' (1986) theoretical prediction suggesting that the regime rewards its core supporters for their loyalty. The study found relatively weak support for the proposition that the rewarding of the core supporters is tactical. The pattern of rewarding appears to be more of strategic character. That is, the rules of the distribution are stable and they are designed so that the most supportive regions to be benefited regardless of periodical fluctuations in the vote. In particular, the regime invests disproportionately in non-Russian and non-Christian Orthodox regions and these regions constantly vote (or falsify votes) for the incumbent.

This chapter continues the debate started in the 1990s by Daniel Treisman who found that regions with more bargaining power (i.e., which declared state sovereignty, lost more man-days to strikes, and voted against Yeltsin or pro-government blocs) received larger federal transfers. From this finding, Treisman was led to conclude that the federal elite, without having other resources for maintaining the federal state, had to resort to the appeasement of rebellious regional elites to prevent them from further disintegrative actions. The situation seems to have changed in the 2000s. Not a single region declares state sovereignty, legitimizes its special status in the constitution, promotes mass strikes or blocks the federal highways at the present day. At the same time, regions that possessed more bargaining power in the 1990s, i.e., regions with populations that ethnically and religiously diverge from central Russia, still manage to negotiate more federal financing for their budgets. And even though bargaining more transfers by challenging the regime in the electoral field has become inadmissible in Putin's era, regional elites are actually encouraged to do just the opposite – to support the regime electorally in exchange for federal transfers. The explanation of this transformation offered in this chapter suggests that the ethnic regions in the 1990s were neither KPRF's core supporters nor Yeltsin's core opponents, rather they opposed Yeltsin for tactical reasons to extract more benefits, privileges and resources from the federal center. The absence of ideological commitment of the ethnic regions to the Communists, as the strongest opposition to the regime during the 1990s, has allowed Putin to offer the ethnic regions another deal: still receive larger transfers yet now in exchange for political loyalty to the regime.

One might conclude from this that, albeit by authoritarian methods, regional separatism in the 2000s was done away with when Putin came to power. In practice, it was rather political manifestations of separatism as a tool for squeezing money from the federal center that was terminated. And even if the political surface is now seemingly calm and free of any unrest, the cultural dimension of separatism is purposefully overlooked by the central authorities. Tatarstan, for instance, does not declare state sovereignty and does not evade paying taxes to the federal budget as it used to be in the 1990s. But more school hours are presently dedicated to teaching the Tatar language than the Russian language in comprehensive schools, whereas a couple decades ago only 7% of pupils were taught their native language in special national schools (Nevzorova 2015). The Supreme Court, by its decree No. 16-P of 16 November 2004, ruled that studying the Tatar language in such large proportion does not contradict the Russian Constitution and that Tatar language courses are obligatory for all school children who can practically neither abstain from studying nor change the Tatar language to any foreign language. A similar situation exists in several regions having "republican" constitutional status.

Turning to another example, anyone may notice that Ramzan Kadyrov, the leader of the Chechen Republic, is overtly loyal to the regime. Vote shares for the federal incumbent presidents as well as for United Russia as the "party of power" tend to approach one hundred percent at the territory of Chechnya. Kadyrov also gained popularity for his pompous expression regarding Putin: "Those who criticize Putin are not human, they are my personal enemies. As long as Putin backs me up, I can do everything – Allahu akbar". This is how he ended his interview to the Newsweek journal (Nemtsova 2010). This Islamic appeal, however, refers not only to Putin's legitimacy but expands further to other spheres of society. In recent years Kadyrov became known as a proponent of polygamy based on the Sharia law, though this is prohibited by Russian legislation and the dominant Christian tradition (Verdihanov 2017). These and many other occurrences of latent separatism still undermine the cultural cohesiveness of the Russian Federation.

Thus, contrary to mass stereotypes imposed by the official media, regional elites strive to attain the popular support, exactly as they did in the 1990s, through substantively separatist policies based on adverse ethnic and religious appeals. A trick developed by the regime in the 2000s is that the regional elites do not declare state sovereignty in their strongholds nowadays and generally refrain from challenging the central authorities in the public sphere so as to bargain more benefits from the federal center. Instead, however, they share their legitimacy derived from the revived ethno-religious policies and state apparatuses, which are corrupted for more operability and impunity in repressing the opposition and perpetrating electoral fraud, with Putin to be eventually rewarded for their loyalty with larger central transfers and with more incentives for corruption, electoral fraud, repression, and ethnicization of politics.

Finally, it is also worth noting that this is only about a half of the story so far as no appropriate data on federal expenditures by region are publicly available. The situation has unfortunately not improved much since the 1990s when McAuley (1997: 440) pointed out that the data are not published presumably because larger expenditures may be used as a proxy for military expenditures that may reveal the location of military formations. The findings of this chapter might have been more pronounced if the full data on the federal expenditures have been available.

Chapter 6. Elite Loyalty versus Mass Loyalty: The Political Outcomes of Distributive Politics

Studying distributive politics, scholars theorize what types of electoral constituencies are rewarded the most (Cox and McCubbins 1986; Lindbeck and Weibull 1987) and test these models empirically (Dahlberg and Johansson 2002; Ansolabehere and Snyder 2006), examine socio-demographic characteristics making voters more susceptible to electoral mobilization via offering particularistic benefits (Stokes 2005; Nichter 2008), explore citizen-politician or voter-broker linkages that make the clientelist exchange credible (Kitschelt and Wilkinson 2007; Muñoz 2014; Zarazaga 2014; Kramon 2017), consider the electoral effects of clientelist policy appeals versus public policy appeals (Wantchekon 2003) or look for an answer to the question why some politicians opt out of clientelism (Weitz-Shapiro 2012).

The literature on distributive politics, however, pays no specific attention to a distinction between incumbent's rewarding strategies toward elites and masses. Do political leaders distribute material benefits to elites and masses equally or disregard one of these groups in favor of the other? Does this between-group balance of the distribution of benefits vary by type of political regime? What political consequences do mass-oriented and elite-oriented types of the distribution entail, especially in authoritarian regimes? This chapter aims to answer these questions by using, along with a set of various explanatory variables, the data on electoral fraud and the sincere incumbent's vote obtained from the analysis of electoral fraud thoroughly carried out in Chapter 4.

Throughout the study and especially in this chapter, I argue that, unlike democracies, where the distribution is targeted primarily at voters, authoritarian leaders have inevitably reward political elites in order to secure their loyalty, which is subsequently converted into electoral fraud, persecution of the media, and other intrinsically authoritarian practices. At the same time, political leaders in electoral authoritarian regimes are expected to deliver politically contingent benefits to voters in order to secure their sincere electoral support. In this regard, electoral fraud and sincere voting for the incumbent are supposedly two major outcomes of the politicized central transfers associated, respectively, with the elite-oriented and mass-oriented incumbent rewarding strategies.

This study differs from the previous research in several respects. First, it analyzes electoral fraud and electoral support separately. Second, rather than using *ad hoc* turnout and vote share thresholds for detecting electoral irregularities, it employs profound quantitative and qualitative measures of electoral fraud developed in Chapter 4. Third, it takes into account not only ethnicity but also religion as indicator of regional identity. Finally and most importantly, this chapter unveils the role of regional elites and federal distributive politics in perpetrating electoral fraud.

The results of analysis in this chapter suggest that, as authoritarianism progresses over time, regional elites manage to derive more and more benefits from the politicized central transfers, whereas the size of regional transfer funds tends to have a much weaker impact on spending to masses in the period from 2000 through 2012. These relatively larger investments in loyalty of political elites do in fact result into several responses of regional elites in the form of electoral fraud, persecution of the media, and other substantially authoritarian practices. However, contrary to theoretical expectations, the hypothesis on patronage voting is not empirically confirmed.

The chapter is structured as follows. The next section explores the consumption of federal transfers with a focus on their prime beneficiaries – the regional bureaucracy as a member of elite clientelist coalition and teaches and doctors as members of mass patronage coalition. In the subsequent section, I proceed to analyzing effects of the politicized transfers and other variables of clientelism on electoral fraud, persecution of journalists, and the general bias of the electoral playing field. The ultimate section tests the hypothesis on patronage voting by examining effects of the politicized transfers and other variables of social spending on the sincere voting for the incumbent. Finally, I summarize and discuss the results in the conclusion.

Patronage Spending versus Elite Appropriation in Consumption of the Federal Transfers

The literature on distributive politics generally assumes that transfers are exclusively targeted at voters. Marques, Nazrullaeva and Yakovlev (2016: 43) formulate this explicitly by assuming that "regional elites serve as conduits and brokers, channeling transfers in ways that maximize vote shares for national politicians rather than consuming them as rents". Other studies, to the contrary, aim to examine the bureaucratic appropriation of transfers. Grossman (1994) found that the size of bureaucracy measured as state and local employment per capita was the strongest predictor of federal grants allocated to states during the era of the Democratic majority in the House of Representatives (1974–1983) having outperformed both election-related variables – the percentage of votes cast for the Democratic governor and the percentage of seats held by the Democrats in the state legislatures. The effect of the size of bureaucracy on federal grants was interpreted by Grossman as the influence of interest groups.

Likewise, Treisman (2002) found that public employment in Russia's regions was better explained by the variable of federal transfers in 1992–1998. Hence, subnational politicians deliberately set public employment levels beyond fiscal capacity of their regional economies, eventually filling this fiscal gap with transfers from the central government. Appropriation of transfer money by the bureaucracy has also been shown in the Brazilian case by Marconi and colleagues (2009). The study revealed that larger transfers entail higher wages for public workers relative to private sector ones, whereas a higher proportion of public employees in the economy increases the wage differential in favor of public workers. Argentina's provincial spending on administrative personnel tends to increase with the amount of central transfers, as has been shown by Remmer (2007). Moreover, changes in transfers entail positive changes in administrative spending but changes in transfers appear not to impact social spending. The analysis of patronage politics in Argentina by Calvo and Murillo (2004), however, ended up with mixed results. Although the Peronist Party vote was positively associated with federal transfers, and public employment induced electoral returns for the Peronists, the share of transfers in provincial expenditures appeared to negatively impact the size of the public sector.

This literature implicitly views the bureaucracy as an actor possessing some bargaining potential to substantiate its demand for larger benefits. I suppose that this is not exactly the case in Russia. It is not the bureaucracy that plays an independent role but rather the top regional elites participating in the bargaining process with the federal center over transfers play a decisive role. Based on the political and economic conditions of their regions, the elites receive the corresponding central remittances. Only after having received the tranches of money do they distribute portions of these sums to the bureaucracy in order to reward it as a member of the clientelist coalition.

Two competing hypotheses are examined regarding how transfer funds are consumed in the regions after having been received from the federal center. On the one hand, the central money can be targeted at voters, such as teachers or doctors as members of the incumbent's patronage coalition, in order to secure their electoral support. On the other hand, the regional authorities may refrain from patronage spending and invest more in the elite in order to buy its loyalty, which will eventually be converted into electoral fraud, repression of the opposition, and persecution of journalists.

To trace patterns of consumption of the central transfers, I rely on three variables of monetary remittances in the regional budget: *money per regional and municipal official*, *money per person employed in education*, and *money per person employed in healthcare*.[146] It is also reasonable to control for the proportion of *regional and municipal officials to the employed* in the region's economy as well as for the relative proportions of *employed in education* and *employed in healthcare* to gauge the size of these spheres in regional economies.[147] Sure enough, these variables are merely approximations of incumbent's distributive policies toward elites and masses. Their advantages include simplicity and comparability between each other. Furthermore, as of 2012, the average size of regional and municipal bureaucracy amounts to 2.9% of the economically active population and 1.4% of the total population – the size that encompasses top political elites and their inner circles in the regions. I do not have clear expectations regarding these variables. What is obvious is that the consumption of transfers by the bureaucracy is favorable mainly to regional elites and represents, therefore, an elite-rewarding strategy, whereas the consumption of transfers by teachers and doctors is beneficial to voters in general and represents a mass-rewarding strategy.

[146] The data on budget expenditures come from Rosstat (2009, 2013, 2014: Ch. 23, 22). The data on state needs expenditures are not available in Rosstat statistical yearbooks for years 2000 and 2004. I have taken it from Budgetary System of Changing Russia of the Center for the Budgetary Monitoring of the Petrozavodsk State University (available at: http://solidbase.karelia.ru). The indicators are in constant prices of 2012.
I tried using the officially reported (at: https://www.fedstat.ru/indicator/33433.do) average nominal monthly wages in general public administration and in organizations of private property at regional level to construct the wage differential, yet I found no relationship of this variable with transfers. It might more likely to occur due to lack of reliability of the data. In year 2012, these two variables have 72.2 percent of the common variance meanwhile the variable of money per one regional and municipal official have 47.6 percent in common with the variable of money per person employed in education and 49.0 percent in common with the money per person employed in healthcare.
[147] The number of the executive body workers of regions and municipalities, the average annual number of employed in education and healthcare, and the overall number of the employed in the economy were taken from Rosstat (2013: Ch. 3).

Table 6.1. OLS and the multilevel models explaining consumption of transfers

	OLS, 2000	OLS, 2004	OLS, 2008	OLS, 2012	OLS, 2000	OLS, 2004	OLS, 2008	OLS, 2012	Fixed Eff., 2000–2012
DV: STB	Recipients				Donors				
(Constant)	-109.66** (-2.34)	15.68 (.62)	16.63 (1.46)	17.95 (1.37)	-11.14 (-.58)	17.64 (1.64)	21.29 (1.17)	42.7** (3.81)	8.1 (.62)
Log Regional Taxes Per Capita, RUB	-.0004** (-2.32)	-.00071*** (-3.79)	-.00071*** (-8.46)	-.00079*** (-7.89)	-.0005*** (-2.74)	-.00038*** (-3.47)	-.00021 (-1.14)	-.00024 (-1.52)	-.00057*** (-8.53)
Log Regional & Municipal Officials in Employed, %	30.07 (1.62)	19.19* (1.89)	28.93*** (5.92)	25.76*** (4.05)	27.23*** (3.22)	9.83*** (2.89)	12.57** (2.76)	11.31** (2.61)	21.48*** (4.81)
Healthcare in Employed, %	5.26* (1.78)	3.86 (1.55)	-.125 (-.14)	-.2 (-.14)	1.84 (1.1)	.445 (.5)	-.488 (-.26)	-2.1 (-1.54)	.882 (1.03)
Log Money per Reg. and Munic. Official, RUB	-1.9e-5 (-1.39)	5.7e-6 (.83)	2.4e-5*** (5.82)	1.6e-5** (2.1)	2.0e-6 (.39)	3.7e-6 (1.43)	2.1e-6 (.27)	6.1e-6 (-1.64)	8.1e-6* (1.84)
Log Money per Person in Healthcare, RUB	.00042*** (3.38)	-1.3e-5 (-.21)	-1.1 (-.57)	2.6e-5 (1.38)	5.0e-5 (.56)	-3.9e-6 (-.24)	-9.2e-6 (-.25)	-3.1e-5 (-1.64)	3.5e-5 (1.15)
R^2 (Random Efffects R^2)	.522	.644	.806	.767	.496	.522	.335	.456	.659
N	25	38	52	49	58	45	31	34	332
DV: STB	Recipients				Donors				
(Constant)	22.18 (.48)	21.16 (1.12)	12.14 (1.02)	10.34 (.94)	2.0 (.15)	18.87** (2.29)	4.67 (.23)	33.62** (2.71)	11.82** (2.19)
Log Regional Taxes Per Capita, RUB	-.00012 (-.56)	-.00056** (-2.72)	-.00069*** (-6.15)	-.00064*** (-5.71)	-.00036** (-2.56)	-.00034*** (-3.31)	-.00033 (-1.59)	-.00016 (-1.04)	-.00044*** (-5.76)
Log Regional & Municipal Officials in Employed, %	-.996 (-.04)	18.99** (2.19)	24.23*** (4.18)	26.86*** (3.96)	25.79*** (3.15)	9.0** (2.58)	11.09** (2.33)	7.87* (1.78)	19.12*** (5.87)
Education in Employed, %	2.33 (1.31)	2.47*** (2.77)	.619 (.71)	.712 (.91)	1.43 (1.51)	.616 (1.06)	1.0 (.64)	.096 (.1)	1.2** (2.39)
Log Money per Reg. and Munic. Official, RUB	2.0e-5 (1.27)	5.4e-6 (.98)	2.2e-5*** (5.01)	2.0e-5** (2.32)	3.6e-6 (.79)	3.5e-6 (1.41)	4.7e-8 (.01)	-1.3e-6 (-.15)	9.1e-6*** (2.81)
Log Money per Person in Education, RUB	-6.9e-5 (-.33)	-4.0e-5 (-.83)	7.5e-6 (.42)	-7.1e-6 (-.3)	-5.4e-5 (-1.01)	-1.6e-5 (-.88)	2.9e-5 (.6)	-2.4e-5 (-.91)	-2.2e-5 (-1.3)
R^2 (Random Effects R^2)	.313	.695	.808	.762	.532	.543	.344	.442	.653
N	25	38	52	49	58	45	31	34	332

Note: Entries are unstandardized coefficients with t-values in parentheses. The multilevel models presented in the last column fit by maximizing the penalized quasi-likelihood (PQL) with the general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. The random term consists of intercepts and coefficients for all variables in the equation varying by year and budget type (random effects are not shown but they are very similar to the OLS coefficients in the models of the corresponding years and budget types). The OLS and multilevel models, along with election-year, take also budget type into account since election-year models do generally not pass heteroscedasiticy tests (their results are more pronounced and shown in Appendix F2). Among the OLS models in Table 6.1, the White heteroscedasticity test is significant at <0.05 level in the following models: 2008 Recipients, healthcare (0.019), 2008 Recipients, education (0.037), 2000 Donors, healthcare (0.005), and 2000 Donors, education (0.002). Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

One analytical approach to estimating the relevance of these incumbent's strategies could be running separate regression models with variables of patronage and elite spending and then comparing the size of the effects between these models (i.e., in 8 models in each of 4 time periods). However, a more precise approach should examine the effect of patronage spending when elite spending is held constant, and vice-versa. Accordingly, Table 6.1 presents a head-to-head comparison of the federal transfers being consumed by the regional bureaucracy, teachers, and doctors. To give the variables more equal chances, I split the analysis into two sets of models that test the effects of outlays on the bureaucracy versus healthcare, and the bureaucracy versus education separately. All models control for the level of regional taxes since rich regions typically receive less transfers but they may allocate larger sums of money for state needs out of their own revenue. Although the dependent variable is the share of transfers in the budget and the spending items are predictors, the effects should rather be interpreted the other way about.[148]

The results of the fixed effects models generally reveal that central transfers tend to be appropriated mostly by the bureaucracy, rather than used for mass patronage purposes. As follows from the t-values, the proportion of regional and municipal officials is 4.7 times more significant compared with the proportion of employed in

[148] This regression design is the only way to meet the aforementioned conditions though for simplicity of interpretation the dependent and independent variables should be reversed. Generally, static regression models that do not take time into account cannot make any causal claims by their nature and the relationships being revealed may be interpreted in both directions if this possibility is not excluded due to the essence of variables (for instance, this is ethnicity that defines the vote but not the contrary). At any rate, there is no theoretical ground to suggest that the allocation of transfers is causally determined by the variables being used in the models as predictors.

the field of healthcare and 2.5 times more significant than the proportion of employed in the field of education. The variable of money allocated per one official in the regional budget turns out to be 1.6 times more significant than the variable of money assigned to a person employed in the field of healthcare and 2.2 times more significant than the variable of money assigned to a person employed in the field of education.[149] Furthermore, all variables of size and monetary allocations to the bureaucracy are significant in both models, whereas only the percentage of employed in the sphere of education is significant among the variables of mass patronage. Hence, the size of regional and municipal bureaucracy tends to be relatively larger than the size of education or healthcare in economically active population and more money is spent on regional and municipal officials than on teachers or doctors as the share of transfers in the regional budget increases.

But probably a more interesting finding comes from the OLS models showing that the effects of patronage and elite spending are not constant over time. In the aggregate, the effects of variables associated with elite consumption gain in size in more recent years, meanwhile the effects of variables of patronage spending either insignificant or lose their significance after 2004. The size of the bureaucracy is significant in both types of regions – donors and recipients, though its effect is about twice as weaker in donor regions. Although the effects of the year 2000 are controversial between donors and recipients, the average t-values indicate an ascending trend from 2000 to 2012 with the apex in 2008 among the OLS models with healthcare variables (the mean t-values between donors and recipients = 2.4, 2.3, 4.3, and 3.3 in 2000, 2004, 2008, and 2012, respectively) as well as with education variables (accordingly: 1.6, 2.4, 3.3, and 2.9). The variable of monetary spending to the bureaucracy becomes significant in more recent years – 2008 and 2012 – in the lower and upper batteries of recipients models in the table. By contrast, the variables of size of healthcare and education and monetary allocations in these areas are sporadically significant only in 2000 and 2004, and they become completely insignificant in the subsequent years.

Thus, the consumption pattern of transfers has experienced the following transformation: in the early 2000s, the transfer funds in regional budgets were distributed in roughly equal proportions between the elite and the general public. The situation changed up to 2012 so that the larger share of transfers in the budget is now only and strongly associated with appropriation of these resources by the

[149] I examined various interaction effects between the variables of size and monetary expenditures. They appeared to be insignificant.

bureaucracy, especially in regions that are net recipients of the federal transfers. Put otherwise, as authoritarianism is progressing, teachers and doctors as members of popular patronage coalition have to content with smaller and smaller portion of transfer money being remitted from the center to regions, whereas the state bureaucracy as a part of the elite clientele diverts more and more funds in its favor.

Political Outcomes of Politicized Transfers: Electoral Fraud, Media Persecution and the General Authoritarian Effect

Chapter 5 has revealed that the federal transfers in Putin's era are distributed largely according to political interests and the prior section uncovered that this distribution tends to favor more regional elites than voters in recent times. The following question is what kind of political consequences do these politicized transfers entail with respect to loyalty of political elites? This section examines effects of central transfers on three particular outcomes of authoritarian politics – *electoral fraud* (as this measure has been developed in the Chapter 4), *pressure on journalists* (the Media Persecution Index and the Media Freedom Index were introduced in Chapter 5), and the general *level of regional democracy*, which summarizes political openness, freedom of the media, civil liberties, rotation of elites, and other elements of regional political regime (the rating of regional democracy is developed by experts of the Moscow Carnegie Center (Petrov and Titkov 2013)[150]).

As to the explanatory variables, several studies found that the probability of electoral manipulation is higher in Muslim and Caucasus regions of Russia (Goodnow, Moser and Smith 2014), in the regions with large shares of ethnic minorities White (2016), in the regions with high percentage of non-ethnic Russians (Bader and Van Ham 2015), and in the ethnic regions as well as in the regions with high percentage of non-Russians (Moser and White 2017). Similarly, I hypothesize that *regional ethno-religious composition* that is distinct from Russian cultural core can be more conducive to various authoritarian practices. I use the Ethnoreligion Index, which is a composite of the share of non-Russian and non-Christian Orthodox populations in regions, and the interaction between them, to gauge

[150] The rating is an index that includes ten composites: political openness, democraticness of elections, political pluralism, independent media, economic liberalization, civil society, political arrangement, elites, corruption, and local governance. Each of them may take a maximum score of five. The maximal score is therefore 50.

regional ethnic identity.[151] A second strong predictor of electoral fraud in Russia detected by several studies is the countryside measured by the *percentage of rural population* (White 2016, Moser and White 2017). I employ this measure along with the *percentage of employed in agriculture* as an alternative measure of the countryside. The both measures are expected to have a positive impact on electoral fraud and other authoritarian practices.

The previous research has shown no consistent effect of such economic variables as regional economic development and economic growth, whereas natural resources wealth has demonstrated a positive effect on electoral fraud in several models (White 2016, Moser and White 2017). Together with *GRP per capita* and *GRP growth* as measures of regional economic development and economic growth, I use *per capita extraction of natural resources* to account for non-tax revenue leading to "resource curse" (Ross 2012; Dunning 2008; Fish 2005: Ch. 5; Gelman et al. 2010; Treisman 2010).

However, these economic variables should supposedly have no independent effect on authoritarian practices. I argue that, to be effective, economic funds should be received by actors primarily responsible for perpetration of electoral fraud and other authoritarian practices, that is, by regional political elites, conditionally on their loyalty. Accordingly, I employ three variables tailored to tap elite clientelism: the *share of transfers in the budget*, and two variables introduced in the prior section – the *percentage of regional and municipal officials in the employed* and *money per regional and municipal official* in the budget. The prior section revealed that the federal transfer funds tend to be appropriated more by the regional bureaucracy as a member of the incumbent's clientelist coalition. In this section, I hypothesize that the larger central transfers in combination with the higher spending to the bureaucracy result into loyalty of regional top and rank-and-file officials that subsequently misuse their bureaucratic apparatuses for promotion of various authoritarian practices. Finally, the size of regional bureaucracy is also expected to be positively associated with authoritarian practices, though its effect is not so theoretically straightforward. It was shown that authoritarian leaders may use valuable positions in the executive for co-optation of rivals making, thereby, their reign in power more stable (Arriola 2009). At the same time, authoritarian

[151] Unlike the Ethnoreligion Index in Chapter 5, the components of which was were attributed such weights to better account for the STB, in this chapter, the components on the Ethnoreligion Index have equal weights. The logged shares on non-Russian and non-Christian Orthodox populations are multiplied by factor of 0.3, and the interaction between them is multiplied by factor of 0.003. As a result, the each component contributes by 1/3 to the Ethnoreligion Index, which varies from 0.7 to 81.1.

leaders may need not to have a huge bureaucratic apparatus to perpetrate electoral fraud, for example. A relatively compact authoritarian state machinery can be efficient as well, if the purpose is selective suppression of opponents or periodical electoral forgery rather than ongoing mass surveillance and terror.

The results of multilevel models of electoral fraud appear in Table 6.2. The bivariate multilevel models indicate that the Ethnoreligion Index (random effects R^2 = 0.245), the share of transfers in the budget (r.e. R^2 = 0.171), and the percentage of rural residents (r.e. R^2 = 0.123) are the strongest individual predictors of electoral fraud.[152] Other variables obtain their explanatory power only in combinations of variables in the multivariate models. The percentage of rural residents, however, completely loses its explanatory power in the multivariate models, whereas effects of the other two variables persist when other variables are controlled for. Nevertheless, it should be noted that regional ethnic and religious identity and the federal transfers are two interrelated and, therefore, mutually suppressive explanations. First, as was shown in Chapter 5, the region's ethnic and religious composition correlates with the central transfers. Second, the Ethnoreligion Index is the major predictor of electoral fraud in Table 6.2. Third, the Ethnoreligion Index does also predict the official incumbent's vote pretty well (in the same model setup as in Table 6.2, bivariate random effects R^2 = 0.357). For this reason, it is difficult to disentangle whether the regional ethno-religious makeup or the central transfers determine electoral fraud.

[152] The prime indicator of interest is random-effects R-squared. Fixed-effects R-squared is reported for informational purposes. It shows to what extent the fixed effects reported in the table provide a good fit for the pooled data. Specifically, a considerable discrepancy between fixed-effects and random-effects R-squared indicates heterogeneity in the data that necessarily should be treated by using a multilevel model. For instance, a negative fixed-effect R-squared of GRP per capita in Table 6.2 indicates that the grand mean explains per capita GRP better than its fixed effect prediction. All random effects in each election year are slightly negative, the fixed effect is accordingly negative, whereas the grand relationship in the pooled data measured by OLS is positive. That is, there are four negative within-year relationships but the groups are ordered so that a spurious relationship papers in the polled data – both per capita GRP and fraud tend to grow over time. Using a non-multilevel model would entail a strong cointegration-related bias in this case.

Table 6.2. Multilevel models explaining electoral fraud in 2000–2012, fixed effects

DV: Log Electoral Fraud, %	Bivariate R-squared[b]	Full Model	Full Model w/o Ethnicity	Social Cleavages	Economic Explanations	Clientelism	Best Model	Best Model w/o Ethnicity
Constant		6.773** (2.04)	7.463** (2.21)	8.791*** (9.41)	25.26*** (8.26)	10.13*** (3.41)	5.918*** (4.24)	5.864*** (3.71)
Ethnoreligion Index	.245*** (.198)	.1332*** (3.66)		.1575*** (5.55)			.1217*** (4.35)	
Rural Residents, %	.123*** (.098)	- .0407 (-.73)	.0294 (.54)	.0255 (.56)				
Employed in Agriculture, %	.063*** (.021)	.1956** (1.88)	.1381 (1.61)	.1347 (1.43)			.1779** (2.56)	.183*** (2.65)
Log GRP per Capita, RUB[a]	.065*** (-.125)	-3.7e-6 (-.36)	-3.9e-6 (-.37)		-4.4e-5*** (-5.37)			
GRP growth, %	.021** (.047)	.1407 (1.45)	.195* (1.92)		.374*** (3.34)			.197** (2.03)
Log Natural Resources per Capita, RUB[a]	.002 (.016)	-8.2e-7 (-.19)	7.9e-6** (2.43)		1.4e-5*** (4.15)			7.3e-6*** (3.3)
Share of Transfers in the Budget, %	.171*** (.181)	.0483* (1.66)	.1005*** (4.11)			.127*** (4.61)	.05*** (2.83)	.109*** (5.55)
Log Reg. & Municipal Officials in Employed, %	.054*** (.084)	.6564 (.51)	-.4156 (-.29)			.3775 (.26)		
Log Money per Reg. and Munic. Official, RUB[a]	.025** (.022)	2.3e-6** (2.37)	3.2e-6*** (3.61)			2.7e-6*** (3.5)	2.6e-6*** (3.04)	3.2e-6*** (3.74)
R-squared by random and (fixed) effects[b]		.344 (.239)	.258 (.306)	.28 (.206)	.122 (.102)	.219 (.222)	.319 (.258)	.248 (.312)
Analogue of the White Test[c]		1.5e-6	7.7e-6	1.8e-9	3.8e-7	7.0e-6	8.4e-6	5.5e-6
Number of obs. by Year	Minimum – 80; Average – 81.5; Maximum: 83							
Total N of obs.	326							

Note: Entries, except those in the first column, are unstandardized coefficients with t-values in parentheses. Models fit by maximizing penalized quasi-likelihood (PQL) with general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. The random term consists of intercepts and each variable's slopes varying by Year. The best model is defined by backward elimination. a. Variables measured in rubles are in constant prices of 2012. b. See comments to Table 5.4 for details on calculation of two types of R^2. c. Indicates R-squared of the model in which the dependent variable is residuals obtained from the model being tested and the right-hand side of the equation includes the same syntax as the model being tested. See Appendix E6 for details on the White test. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

From the theoretical perspective of this study, the incumbent distributes rewards in the form of central transfers chiefly to his loyal supporters. The incumbent infers the level of his support from the official level of the vote, which consists of the sincere vote and electoral fraud. Regional elites, in their turn, have an incentive to provide the incumbent with a higher rate of the official electoral support that can be easily done by means of fraud in order to receive larger central transfers. Ethno-religious aspects may intervene in this process in several ways. First, ethnicity and religion may have a supplementary effect on electoral fraud independently of transfers. To test this explanation, Table 6.2 reports full and best models with and without the Ethnoreligion Index. When the Ethnoreligion Index is not in the model, the variable of transfers takes over the effect of ethnicity and religion: the effect of the STB increases twofold from 0.048 to 0.101 in the full model and from 0.05 to 0.109 in the best model. Therefore, the supposition that ethno-religious aspects and central transfers are two independent predictors of electoral fraud is strongly rejected. Second, non-Russian and non-Christian Orthodox regions could be more responsive to the incumbent's clientelist offer – federal transfers in exchange for political loyalty – in providing more electoral fraud. However, the second explanation is also refuted empirically. I tried to test an interaction effect between the Ethnoreligion Index and the STB, it appeared to be insignificant. Third, there could be a mediation effect of the central transfers on ethno-religious makeup in determining electoral fraud. It implies that the central government allocates transfers based predominantly on its ethno-religious preferences, not on the concerns of electoral loyalty, and then the transfer funds translate into electoral fraud. This explanation is not confirmed empirically as well. If the mediation effect took place, the effect of ethnicity and religion would drop precipitously, while the effect of transfers would remain nearly the same as in the bivariate model, if the variable of transfers is held constant. The results of the full and best models indicate that, if the two variables are simultaneously in the equation, both the Ethnoreligion Index and the STB lose their explanatory power by nearly a half.

Consequently, if there is no evident preponderance between the variables and they mutually suppress each other in the models, the fourth explanation regarding the role of regional ethno-religious identity relatively to the role of central transfers in determining electoral fraud looks more plausible. As was argued in Chapter 5, the federal center offered the ethnic regions a new deal in the early 2000s – central transfers in exchange for political loyalty instead of the politics of fiscal appeasement of ethnic separatism practiced in the 1990s. As a result of this agreement, the ethnic regions transformed into regions with high levels of the official electoral support for the incumbent, that is, as this section shows, with larger amounts of electoral fraud and, as the next section will reveal, with also somewhat slightly higher levels of sincere vote for the incumbent. These regions are granted larger central transfers for their electoral allegiance and they provide their electoral support in return for transfers. Therefore, regional ethno-religious makeup and central transfers are inextricably interrelated. It is impossible to account for electoral fraud only by ethno-religious concerns (as the political experience of the early 1990s shows, the ethnic regions could potentially commit fraud against the incumbent). It is also problematic to explain electoral fraud solely by the central transfers inasmuch as their prime recipients are the ethnic regions.

Since the effects of variables may change under the influence of other variables, Table 6.2 reports also tree models representing the major groups of variables. The social cleavages model has the largest explanatory power (r.e. $R^2 = 0.28$). This share of variance is explained almost exclusively by the Ethnoreligion Index so long as other variables in the model are insignificant. If the value of the index is shifted from its 5th to 95th percentile, the model predicts an increase in electoral fraud of 8.7%. Although the variables associated with the economy are insignificant in the full and the best model, they are all significant in the economic explanations model. Expectedly, the regional level of economic development is negatively related to electoral fraud. Its marginal effect of a 5th – 95th percentile change (ME) on electoral fraud amounts to -7.1%. The regional economic growth, contrary to theoretical expectations, is rather favorable to electoral forgery. Its ME is estimated at 3.7%. The per capita income from extraction of natural resources is also positively related to fraud (ME = 4.3%). However, the solely economic explanations account merely for 12.2% of electoral fraud variance. The variables of clientelism, except the size of regional bureaucracy, have expected significant effects on electoral fraud in all models. In the clientelism model, the marginal 5th – 95th percentile change in the share of transfers in the budget leads to an 8.5-percent increase in the level of fraud, whereas the monetary allocations per regional and municipal bureaucrats correspondingly increase electoral fraud by 3.7%. The share of variance explained by the model is five percent smaller in the absolute value (r.e. $R^2 = 0.219$) compared with the social cleavages model.

If we proceed to the best model, it turns out that, besides the variables of clientelism and ethno-religious identity, only the percentage of employed in agriculture is significant in determining electoral fraud (ME = 3.9%). In this model, compared with the models representing the groups of variables, the ME of the Ethnoreligion Index is smaller by one third (6.7%), while the ME of the variable of central transfers has diminished twofold (3.4%), and the ME of spending to the bureaucracy has remained nearly the same (3.6%). If we consider the joint marginal 5th – 95th percentile change of the variables of clientelism and ethno-religious identity setting the percentage of employed in agriculture at its mean, the expected amount of fraud would enlarge from 12.3% (3.0% in a non-log-transformed variable, which is the average 2000–2012 level of Perm Krai) to 25.9% (analogously, 16.5% or the level of Tuva Republic).

Although the central transfers and the regional ethno-religious composition are empirically interrelated, we may try to model a situation in which they could be independent. The best model without the Ethnoreligion Index shows the results. If ethno-religious aspects are not controlled for, two additional variables gain significance – GRP growth and per capita income from natural resources, though their MEs are not large – 2.0% and 2.2%, respectively. While the MEs of the employment in agriculture and the monetary spending to the bureaucracy have remained almost unchanged (4.0% and 4.4%, respectively), the ME of the STB has enlarged substantively to 7.3%. If we again model the joint marginal 5th – 95th percentile change by using only two variables associated with clientelism to predict electoral fraud keeping the other variables at their means, the estimated effect appears very similar to that estimated in the best model. In a region with the 5th-percentile levels of federal transfers and spending to the bureaucracy, the amount of electoral fraud is expected to be 13.5% (3.5% in a non-log-transformed variable, which is the average 2000–2012 level of Yaroslavl Oblast). If the federal transfers and spending to the bureaucracy increase simultaneously to their 95th-percentile levels, the amount of electoral fraud rises to 25.2% (analogously, 18.4% or the level of Kabardino-Balkar Republic). Thus, the amount of electoral fraud in the period of 2000–2012 is primarily explained by the federal transfers allocated to the regions based on their electoral loyalty to the central incumbent and by the regional spending to the bureaucracy as a member of incumbent's clientelist coalition.

The second detrimental effect of the politicized transfers is repression applied against journalists. Table 6.3 displays OLS models explaining two variables accountable for political environment in which journalists have to work – the Media Persecution Index, which is an objective measure of the number of reported assaults on journalists, and the Press Freedom Index, which is an expert index.[153] The central transfers apparently induce repression of the media only with respect to the Media Persecution Index. According to the best model, keeping the percentage of employed in agriculture constant, the marginal shift in transfers from the 5th percentile (10.8%) to the 95th percentile (72.8%) produces an increase in the Media Persecution Index of 40.2 points from 78.5 (the level of Ivanovo, Leningrad, and Vologda Oblasts) to 118.7 (the level of Kabardino-Balkar Republic, Pskov Oblast, and Arkhangelsk Oblast). The percentage of employed in agriculture is the next and the only significant variable in the model besides the STB. Its effect is unexpectedly negative yet similar in the size (ME = -41.7 points) to the marginal effect of the STB. Surprisingly, other variables demonstrate no significant effect on the Media Persecution Index either in the full and best models.

Table 6.3. The determinants of persecution of journalists, OLS models

	DV: Log Media Persecution Index		DV: Press Freedom Index	
	Full Model	Best Model	Full Model	Best Model
Constant	112.778*** (2.95)	95.039*** (12.97)	2.5432*** (2.96)	2.9672*** (7.83)
Ethnoreligion Index	.128 (.51)		-.0101* (-1.8)	-.007* (-1.68)
Rural Residents, %	-.0267 (-.05)		-.0005 (-.04)	
Employed in Agriculture, %	-2.0096* (-1.91)	-1.9455*** (2.94)	-.0041 (-.17)	
Log GRP per Capita, RUB	-7.9e-6 (-.07)		1.4e-6 (.58)	
GRP growth, %	.1695 (.1)		-.0231 (-.58)	
Log Natural Resources per Capita, RUB	2.0e-5 (.68)		5.5e-7 (.82)	
Share of Transfers in the Budget, %	.8202** (2.11)	.6478*** (3.11)	.0099 (1.13)	
Log Reg. & Municipal Officials in Employed, %	-17.605 (-1.13)		-.6286* (-1.79)	-.4132* (-1.82)
Log Money per Reg. and Munic. Official, RUB	-6.3e-6 (-.32)		-5.3e-8 (-.12)	
R-squared	.156	.127	.14	.105
White's heteroscedasticity test	.031	.198	.433	.475
N	83	83	83	83

Note: Entries are unstandardized coefficients with t-values in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

There are also only two significant variables in the full and best models of the Press Freedom Index. In this time, however, the variable of central transfers is not

[153] The indices are introduced and described in Chapter 5.

significant. Instead, the Ethnoreligion Index and the size of regional bureaucracy significantly influence the level of regional press freedom. Their marginal effects are expectedly negative and amount respectively to -0.39 and -0.46 points (on a three-point scale of the index). Explanatory power and statistically significant effects are relatively small throughout all models. Nevertheless, among the available explanations, the share of transfers in the budget and the Ethnoreligion Index again turn out to be the best predictors of an outcome of authoritarian politics – creating a hostile environment for journalists in order to complicate delivering of unbiased information to the society.

Now we proceed to examining of the overall consequences of the politicized transfers, that is, to their effect on regional political regimes. The multilevel models in Table 6.4 show fixed effects of the earlier used set of predictors on the level of regional democracy.

In the bivariate models, the best predictors appeared to be the share of transfers in the budget (r.e. R^2 = 0.325), the percentage of rural residents (r.e. R^2 = 0.305), and the size of regional bureaucracy (r.e. R^2 = 0.212). The results of the multivariate models came to be substantively similar to the results of modeling of electoral fraud in Table 6.2. The percentage of rural residents again loses its significance in almost all multivariate models and the percentage of employed in the sphere of agriculture becomes significant instead, whereas the Ethnoreligion Index and the variables of clientelism have the strongest impact on the regional political regime. The latter ones obtained even a stronger influence vis-à-vis the variable of ethno-religious concerns compared with the models of electoral fraud. The central transfers and the regional ethno-religious composition are still two interrelated and mutually suppressing explanations. Among all other variables, the effect of the STB is altered the most in the full and best models if the Ethnoreligion Index is excluded. On average, the models of regional democracy have greater explanatory power (r.e. R^2 = 0.374) than the models of electoral fraud (r.e. R^2 = 0.256).

Table 6.4. Multilevel models explaining the regional level of democracy in 2000–2012, fixed effects

DV: Rating of Democracy	Bivariate R-squared	Full Model	Full Model w/o Ethnicity	Social Cleavages	Economic Explanations	Clientelism	Best Model	Best Model w/o Ethnicity
Constant		42.819*** (13.95)	42.534*** (13.6)	39.498*** (45.6)	16.359*** (9.9)	41.024*** (18.23)	42.819*** (16.8)	45.869*** (18.41)
Ethnoreligion Index	.149*** (.154)	-.0549*** (-2.66)		-.0782*** (-4.11)			-.0528*** (-2.79)	
Rural Residents, %	.305*** (.305)	-.0157 (-.37)	-.0388 (-.92)	-.1709*** (-5.01)				
Employed in Agriculture, %	.174*** (.18)	-.2152*** (-3.02)	-.1954*** (-2.64)	-.1162* (-1.81)			-.2266*** (-4.42)	-.2582*** (-5.04)
Log GRP per Capita, RUB	.167*** (.096)	1.2e-5 (1.06)	1.2e-5 (1.12)		6.1e-5*** (7.48)		1.4e-5* (1.89)	
GRP growth, %	-.008 (.003)	.0399 (.43)	0.0096 (.10)		-0.2102** (-2.34)			
Log Natural Resources per Capita, RUB	.01*** (.02)	2.3e-6 (.86)	-1.7e-6 (-.64)		-1.1e-5*** (-3.83)			
Share of Transfers in the Budget, %	.325*** (.275)	-.0604*** (-2.61)	-.0819*** (-3.48)			-.1367*** (-7.76)	-.0625*** (-2.78)	-.0974*** (-4.94)
Log Reg. & Municipal Officials in Employed, %	.212*** (.155)	-4.5038*** (-3.73)	-4.3786*** (-3.0)			-4.4511*** (-2.99)	-4.8489*** (-3.58)	-5.0017*** (-3.3)
Log Money per Reg. and Munic. Official, RUB	.01 (-.006)	-1.6e-6** (-2.21)	-1.8e-6** (-2.17)			4.8e-8 (.07)	-1.3e-6* (-1.78)	-1.5e-6** (-2.0)
R-squared by random and (fixed) effects		.437 (.404)	.43 (.389)	.340 (.340)	.194 (.179)	.366 (.292)	.435 (.406)	.414 (.363)
Analogue of the White Test		1.0e-5	5.7e-6	9.0e-6	6.0e-6	1.5e-6	6.0e-6	3.3e-6
Number of obs. by Year	Minimum – 83; Average – 83; Maximum: 83							
Total N of obs.	332							

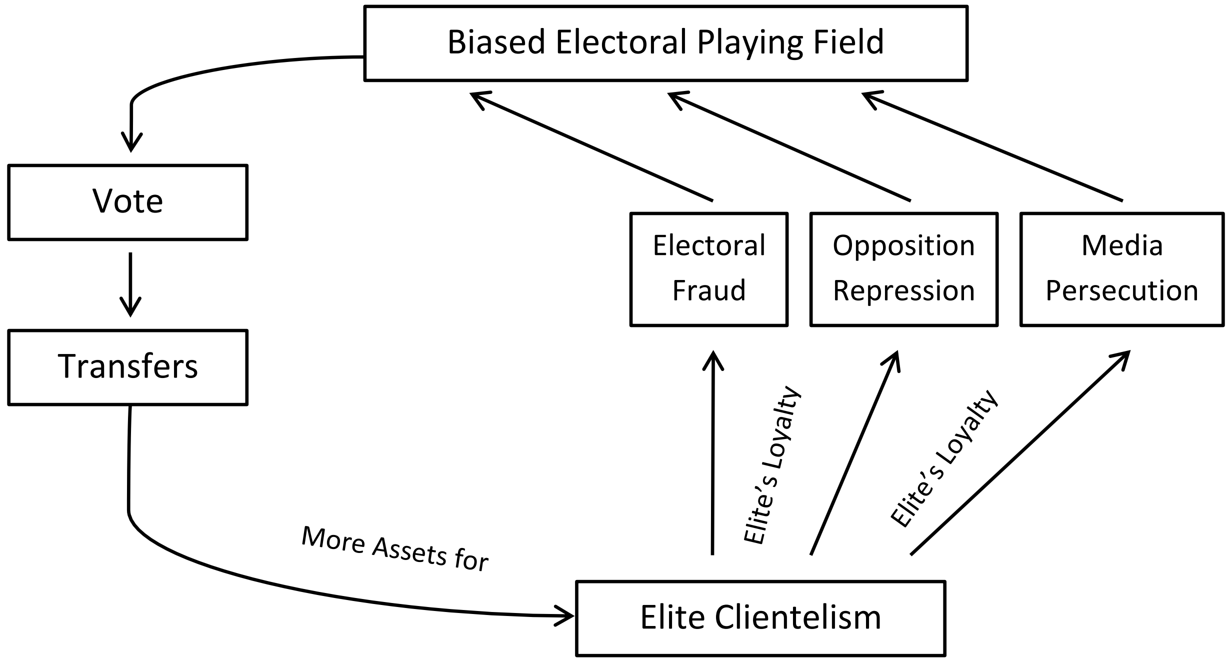
Note: Entries, except those in the first column, are unstandardized coefficients with t-values in parentheses. See comments to Table 6.2 for details. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

All variables demonstrate significant expectedly negative effects on democracy in the social cleavages model. On the scale of the rating of democracy ranging on average between 2000–2012 from 18.2 (the 5th percentile) to 41.0 (95th percentile), the marginal effect produced by a 5th – 95th percentile change in the percentage of rural residents is the largest (-8.3), even though the variable is significant only in this model specification, then follows the ME of the Ethnoreligion Index (-4.3), and the ME of the percentage of employed in agriculture (-2.6). In the economic explanations model, the level of regional economic development has a strong and expectedly positive effect on the level of democracy suggested by the modernization theory: the more economically developed a region is the more likely it is to be democratic (ME = 9.8). Economic growth, to the contrary, has slightly negative effect on regional democracy (ME = -2.1). Similarly, natural resources abundance is associated with lower levels of democracy (ME = -3.4). Notwithstanding this particular result, which is in line with theoretical expectations, the effects of economic variables fade away when other variables intervene. The model of clientelism explains the largest share of variance (r.e. $R^2 = 0.366$). In this model, the marginal change in the STB accounts for a 9.2-point decline in the level of democracy as well as the share of the bureaucracy in economically active population is adverse to democracy (ME = -4.5).

The best models, alongside the variables of clientelism and regional ethno-religious structure, include also the percentage of employed in agriculture. The more agricultural the region, the less democratic its political system (ME = -5.0 and -5.7 in the best model and the best model without the Ethnoreligion Index, respectively). The marginal change in regional per capita GRP is associated with a 2.6 points better state of democracy in a region, according to the best model. The MEs of the Ethnoreligion Index, the STB, the size of bureaucracy, and spending to the bureaucracy are equal, respectively, to -2.9, -4.2, -4.9, and -1.8 points. If we model the joint marginal effect of these variables keeping other variables at their means, we will come up with the predicted level of democracy of 35.3 points (the average 2000–2012 the level of Pskov Oblast) at low values of the predictors and the predicted level of democracy of 21.5 points (the average level of North Ossetia) at high values of the predictors. The joint marginal effect of the same variables at the means of other predictors in the best model without the Ethnoreligion Index is pretty much similar. In a region with the 5th-percentile levels of the STB, the size of the bureaucracy and spending to the bureaucracy, democracy is expected to be at the level of 37.3 points, whereas shifting of the predictors simultaneously to their

95th-percentile levels decreases the rating of democracy to 23.7 points. Stated otherwise, the politicized transfers in combination with clientelist inducements to regional bureaucratic apparatuses promote authoritarianism.

Figure 6.1. The vicious circle of subnational authoritarian political economy



Thus, the results of this section show that loyalty of regional elites secured by means of federal transfers is converted into electoral fraud, persecution of the media, and the promotion of authoritarian practices in general. Not only does the politicized distribution of central transfers favor the most loyal elites, it also entails the elites' response in the form of various intrinsically authoritarian practices that eventually reinforce the regime. This tragic logic is finally summarized in Figure 6.1.

Sincere Voting for the Incumbent as a Political Outcome of Politicized Transfers?

To what extent do the politicized transfers influence sincere voting for the incumbent? The previous section provided the evidence that the federal transfers allocated to regions contingently on their electoral results for the central incumbent presidents entail several responses of regional elites in the form of intrinsically authoritarian practices. This section examines the effect of the politicized transfers on electoral behavior using the authentic (i.e., non-affected by fraud) incumbent's vote shares from the four presidential elections of 2000–2012 obtained as a result of the analysis of electoral fraud in Chapter 4. However, contrary to theoretical expectations, I find no considerable effect of variables associated with patronage voting. Instead, along with the effects of socioeconomic variables, the results of the analysis show the regional ethno-religious identity, specifically the share of non-Russian and non-Christian Orthodox populations in the regions, to be the best predictor of the sincere vote for the incumbent. However, this effect is not monotonic and not constant over time – the finding holds true for the ethnic regions only and for election years 2004, 2008, and especially 2012.

The previous research on Russian presidential elections did make no explicit attempts to examine sincere voting for the incumbent. Nonetheless, several studies, acknowledging that the official electoral results are strongly influenced by fraud under electoral authoritarianism, introduce thresholds to account for electoral fraud. Findings of these studies overwhelmingly suggest that ethnicity has the strongest effect on the incumbent's vote. In particular, White (2015) introduced a turnout threshold to isolate the effects of ethnicity on United Russia's electoral performance from electoral manipulation. On average in the three parliamentary elections of 2003–2011, the threshold cuts off merely 6.5% of supposedly manipulated observations at the average level of turnout exceeding 90.3%. According to the results of Chapter 4, this threshold is obviously insufficient so long as only about one fifth of observations belonging to the 1st cluster were detected as having minor electoral violations. Although the central argument places ethnicity in the center among other determinants of support for United Russia, the presented empirical evidence is rather favorable to the importance of another social cleavage. The percentage of rural population explains much more variance of the United Russia's vote (the average t-value between 2003 and 2011 is equal to 13.4) than the percentage of non-Russians (t-value = 2.9) and the "ethnic" constitutional status of the region (t-value = 2.7).[154]

In a similar analysis of United Russia strongholds in 2007 and 2011, White (2016) uses the same threshold for detecting electoral malfeasance and presents the models for the pooled data controlling for the dichotomous variable of electoral fraud and for the data without supposedly manipulated observations. The results of both types of models, which are just one iota as different, indicate that the percentage of non-Russian minority determines whether the region is a United Russia stronghold or not (the share of the vote is higher or lower than one standard

[154] Calculations are based on Table 4 in the article.

deviation) at a commensurable level as the percentage of rural population. Examining electoral mobilization in the Russian 2000 and 2004 presidential elections, Saikkonen (2015) included a dummy variable proxying electoral fraud via indicating observations in which both turnout and votes for the winning candidate exceed 90%. In this study, the percentage of non-Russian is shown to be the second-best predictor of turnout after the percentage of employed in agriculture, while results of the models with and without the variable of electoral fraud are also pretty much similar suggesting, thereby two possible explanations. First, this is evident that the threshold cuts off a tiny fraction of actually fraudulent data limited only to the observations of extreme fraud. Consequently, the results may show the effect of ethnicity on electoral fraud rather than on the sincere incumbent's vote. Second, even though the sincere vote is not isolated from electoral fraud, the relationship between ethnicity and the sincere vote may be the same as the relationship between ethnicity and electoral fraud. In this case, using a more precise delimitation between electoral fraud and the sincere vote would confirm a similarity of the effects of ethnicity.

Other studies that do not control for electoral fraud also find a positive association between ethnicity and voting for incumbency in Russia. Reisinger and Moraski (2009) constructed a measure of deference to the Kremlin consisting of regional shares of the vote for incumbent presidential candidates and State Duma parties loyal to the Kremlin, and turnout in these elections. The results of their study show that changes in deference to the Kremlin from 1995/96 to 2007/08 were less likely observed in the regions with large percentage of ethnic Russians and that the effect of regional ethnic composition on deference to the Kremlin is significant only in the ethnic regions. Hale (2007) argues that governors of the ethnic regions have an additional patronage opportunity in delivering of club benefits to voters from their own ethnic group in exchange for their votes. He shows that the region's constitutional status and the governor's titular ethnicity increase the level of the vote for governor's candidates in Russia's 1999 single member district Duma election. This study, however, only assumes but not examines in detail the clientelist linkages – the possibility for governors to monitor the "ethnic vote" and to allocate ethnic rewards and punishments. It does also not test whether the governors' candidates were the members of the regions' dominant ethnic groups to treat such vote as "ethnic".

Contrary to the studies drawing their inferences from official electoral data, a study by Colton and Hale (2009) based on survey data finds no substantive effect of ethnicity and religion on voting for Russian presidents from 1996 through 2008. The variable of Orthodox faith is significant only in determining the reported vote for Putin in 2004, whereas the variable of Russian ethnicity is insignificant in all election years. In a similar vein, no significant effect of religion and ethnic Russians on support for Putin's policies was found by White and McAllister (2008) in the analysis of a 2008 survey. In their earlier survey-based study, White and McAllister (2003) did not use a variable of ethnicity to predict voting for Putin in the 2000 presidential election. At the same time, they show that the probability of voting for Putin is slightly higher non-believers. Nevertheless, inasmuch as explanatory power of the models in both studies is small (8% and 2%, respectively) the authors point out that the Putin leadership has relatively weak roots in the society. The absence of confirmation of the effect of ethnicity and religion on political support for Putin and Medvedev in the survey-based studies may indicate that this effect is actual only for electoral fraud but not for the sincere incumbent's vote. Alternatively, however, this finding may result from a bias in the sample: Chechnya and other most prominent non-Russian and non-Christian Orthodox regions are typically bypassed by polling agencies.

In this section, I employ the variable of *sincere incumbent's vote* scrupulously developed in Chapter 4 and the *Ethnoreligion Index*, which accounts not only for the share of non-Russian population but also for the share of non-Christian Orthodox believers in the regions, and the interaction between them, in order to overcome measurement-related problems of the previous studies and examine the relationship between the regional ethno-religious identity and the sincere incumbent's vote more properly.

The set of other explanatory variables of sincere voting for the incumbent generally overlaps with explanations of electoral fraud presented in the prior section but expands beyond them. Additionally to the variables of social cleavages from the previous section – the percentage of *rural residents* and *employed in agriculture*, I use also the percentage of *population over working age* and the percentage of persons with *higher education*. The previous studies show mixed results with respect to the relationship of the latter two variables with electoral or policy support for the incumbent. These variables are either insignificant (Treisman 1999: Ch. 4; White and McAllister 2003) or age has a negative effect while education is insignificant (White and McAllister 2003; Colton and Hale 2009). The literature also diverges regarding the effect of urbanization, yet its differentiation is systematic. While the studies based on the official electoral data find a strong positive effect of urbanization (White 2015; 2016), the survey-based studies find no significant effect (White and McAllister 2003; 2008) or a controversial effect of urbanization (Colton and Hale 2009). Accordingly, I do not have clear expectations regarding these variables except that their effects should not be strong.[155]

The set of economic voting variables includes variables that appeared in the analysis earlier: *per capita GRP*, *GRP growth*, the percentage of *unemployed* and the percentage of people with income *below the living minimum*. According to the economic voting hypothesis (Fiorina 1981; Powell and Whitten 1993), I expect that these variables are positively associated with sincere voting for the incumbent. The level of GRP, however, may constitute an exception. Since elections in Putin's times are not ordinary elections but elections under authoritarianism, the relationship may be determined by the modernization theory (Lipset 1959, Przeworski et al. 2000). Namely, voters in more prosperous regions may claim more democracy and vote, therefore, against the authoritarian incumbent.

As shown in Chapter 4, voters in practice receive their welfare from different sources. While economies of one group of regions are self-sufficient, the other group of regions cannot meet their ends without external donations, they are net recipients of federal transfers. As also argued in this chapter, regional authorities may channel the federal money to either elites in order to buy their loyalty signalized via electoral fraud and other authoritarian practices or masses in order to secure their genuine political support translated into sincere voting for the incumbent. To account for patronage voting, I employ variables of the *share of transfers in the budget*, *per capita social spending*, the percentage of *employed in education*, and the *money per person employed in education*. The variable of social spending includes expenditures of consolidated regional budgets on education, healthcare, and social policy, thereby, it accounts for the spending broadly targeted at voters.[156] The per capita monetary allocations to the employed in education and the size of the sphere of education also account for social spending but in a more detailed manner. If a phenomenon of patronage voting takes place, all these variables are expected to be positively associated with the incumbent's vote.

[155] The data on the percentage of persons with higher education in election years 2000 and 2004 come from the national census of 2002 (available at: http://www.perepis2002.ru/ct/doc/TOM_03_03.xls). For election years 2008 and 2012 I use the data of the national census of 2010 summarised by Rosstat (2013).
[156] The data on expenditures on "socio-cultural activities" come from Rosstat (various years).

Table 6.5. Multilevel models explaining the sincere incumbent's vote in 2000–2012, fixed effects

DV: Sincere Incumbent's Vote, %	Bivariate R-squared	Full Model	Full Model w/o Ethnicity	Social Cleavages	Economic Voting	Patronage Voting	Best Model	Best Model w/o Ethnicity
Constant		68.332*** (8.95)	81.122*** (10.84)	53.818*** (12.91)	62.149*** (15.81)	49.044*** (10.34)	76.976*** (18.8)	72.7234*** (13.91)
Ethnoreligion Index	.154*** (.053)	.1392*** (4.0)		.1734*** (5.93)			.1192*** (5.42)	
Log Population Over Working Age, %	.05*** (.018)	.2109 (1.27)	-.1682 (-1.14)	.3344*** (2.78)				
Higher Education, %	.04*** (-.049)	-.4609*** (-2.78)	-.3165** (-2.09)	-.405*** (-3.01)			-.4899*** (-3.21)	-.3255* (-1.78)
Rural Residents, %	.052* (.011)	.0094 (.16)	.0244 (.38)	.081* (1.74)				
Employed in Agriculture, %	.034 (.004)	-.2422** (-2.27)	-.2387** (-2.31)	-.3316*** (-2.8)			-.275*** (-3.58)	-0.2467*** (-2.76)
Log GRP per Capita, RUB	-.041* (.047)	-5.7e-5** (-2.26)	-6.6e-5** (-2.44)		-2.3e-5*** (-2.67)		-4.1e-5*** (-3.05)	-3.8e-5*** (-2.79)
GRP growth, %	.033*** (.133)	.2953* (1.68)	.3394** (2.13)		.4192*** (3.35)		.4194*** (2.35)	.4593*** (2.6)
Log Unemployment, %	.042 (-.067)	.0238 (.13)	-.0482 (-.26)		.2414* (1.69)			
Below Living Minimum, %	.000 (-.003)	-.1613** (-2.57)	-.1904*** (-2.63)		-.0934** (-2.13)		-.1292*** (-3.52)	-.1315*** (-3.14)
Share of Transfers in the Budget, %	.052 (.013)	-.0397 (-1.14)	-.0387 (-1.08)			-.0156 (-.47)		
Log Social Spending per Capita, RUB	.046 (.032)	3.8e-5 (.93)	4.1e-5 (.91)			-8.8e-5 (-1.63)		
Education in Employed, %	.089*** (.029)	.1576 (.75)	.3684* (1.69)			.7328*** (3.52)		.5227** (2.42)
Log Money per Person in Education, RUB	.039 (.004)	1.4e-5 (1.44)	9.5e-6 (.83)			2.9e-5* (1.67)		
R-squared by random and (fixed) effects		.381 (.376)	.306 (.328)	.263 (.072)	.096 (.119)	.159 (.07)	.293 (.159)	.212 (.174)
Analogue of the White Test		1.5e-6	1.8e-6	2.2e-11	1.6e-5	3.8e-6	8.5e-6	3.5e-6
Number of obs. by Year	Minimum – 80; Average – 81.5; Maximum: 83							
Total N of obs.	326							

Note: See comments to Table 6.2 for details. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The results of the bivariate multilevel models presented in Table 6.5 indicate that there is only two relevant predictors of the incumbent's sincere vote – the regional ethno-religious identity (r.e. R^2 = 0.154) and the percentage employed in the sphere of education (r.e. R^2 = 0.089). Other variables as single predictors do not explain more than five percent of the variance. There are six statistically significant variables in the full model that also remain significant in other models. The strongest of them – the Ethnoreligion Index – is also the best predictor of the authentic incumbent's vote in other models. The positive relationship suggests that non-Russian and non-Christian Orthodox social groups apparently constitute a sizable electoral base of the incumbent. This result is in accordance with the finding by White (2015) that the United Russia's regional support in the parliamentary elections of 2003–2011 is concentrated in the regions with high percentage of titular ethnic minorities, even in the absence of electoral fraud (White 2016). The results of the analysis of the sincere incumbent's vote, however, diverge with the second main finding by White (2015; 2016) that the incumbent is supported more in the countryside. The percentage of rural residents, which is used in her analysis, is only marginally significant in the social cleavages model. Instead, the percentage of employed in agriculture (an alternative to urbanization though not exact measure of the countryside)[157] has a relatively strong and *negative* effect on the authentic incumbent's vote in all models. It should be noted, however, that this negative effect appears only in combination with other variables; the percentage of employed in agriculture has no independent significant effect on the authentic incumbent's vote.

Other socioeconomic variables generally have expected effects. An interesting finding from Table 6.5 is that higher education is negatively associated with sincere voting for authoritarianism. It is not surprising, therefore, that authoritarian leaders are not interested in highly educated citizens, especially in Russia, where permanent "reforms" of education pursue the goal to "nurture a qualified consumer" instead of a "human-creator".[158] Regional per capita GRP is also

[157] The measure of employed in agriculture implies that the rural area not only exists but is also used for agriculture. Therefore, it may diverge from the percentage of rural residents. For example, as of 2012, 60.1% (2.3 standard deviations above the mean) of Ingushetia's population lived in the rural area, yet only 8.3% (0.5 SD below the mean) of them were employed in agriculture.

[158] Andrei Fursenko, the minister of science and education of the Russian Federation in 2004–2012 known as the initiator of the reduction in the number of universities, the proponent of a new federal educational standard according to which lessons "Russia in the World", "Fundamentals of Life Safety", and physical training but not physics, chemistry, biology or a foreign language to be mandatory for all school children, and also one of the curators of the education cooperation program with the European University Institute under which this dissertation is written, said at a pro-regime youth forum on Seliger in 2007 that "the shortcoming of the Soviet education system was an attempt to form a human-creator but now the task is to nurture a qualified consumer who can skillfully use the results of the creativity of others" (Fursenko 2013).

negatively related to the sincere incumbent's vote. This result is in line with economic development theory suggesting that high income is disadvantageous for authoritarianism. The positive effect GRP growth supports the theory of economic voting in authoritarian settings: economic growth is favorable to electoral support for authoritarian leaders. In accordance with economic voting theory, the percentage of people with income below the living minimum also has a negative effect on sincere voting for the incumbent. It must be underlined again, however, that these effects should be viewed with some degree of caution since they emerge only in multivariate models. Even though significant, the socioeconomic variables explain relatively small shares of variance: 14.4% in the social cleavages model without the Ethnoreligion Index, 9.6% in the economic explanations model, and 20.9% in the best model without Ethnoreligion Index and the percentage of employed in education.

In the full model without the Ethnoreligion Index, the effects of explanatory variables are mainly not altered with exception of the percentage of employed in education. The variable's coefficient becomes significant, though only marginally, if regional ethno-religious identity is not controlled for. Similarly, the size of education is significant in two other models without the Ethnoreligion Index. In this relation, the most important result is that the multilevel models do not find support for the hypothesis on patronage voting. Although the variables of size and monetary expenditures to education are significant in the patronage voting model, the share of transfers in the budget and per capita social spending in the budget have no significant effect on the sincere vote for the incumbent throughout all models.

The marginal effects produced by 5^{th} – 95^{th} percentile changes in the variables of the best model are equal about to five percent. As the Ethnoreligion Index shifts from its 5^{th} percentile to the 95^{th} percentile, the sincere incumbent's vote increases by 6.6%, the percentage of people with higher education decreases it by 4.4%, as well as do it regional economic development (ME = -6.7%), the percentage of people with income below the living minimum (ME = -3.5%), and the percentage of employed in agriculture (ME = -6.1%), whereas economic growth makes the authentic incumbent's vote larger by 4.2%.

Since it was found in the previous section that the level of electoral fraud is higher in the ethnic regions, it can be asserted that the effect of the Ethnoreligion Index on the sincere incumbent's vote is substantively spurious and results from erroneous nature of the dependent variable, namely, that it still contains a considerable portion of electoral fraud along with the variation of the sincere vote. This question can be addressed toward the effects of other variables also but the commonality of the effect of ethno-religious concerns between the models of electoral fraud and the sincere incumbent's vote is the most remarkable and, therefore, the most suspicious. Such doubts have theoretical grounds. As was theorized in Chapter 4 and empirically shown in its section "Adjusted QR Estimate", the quantitative estimate of the authentic incumbent's vote tends to be indiscriminant between the authentic vote and fraud at high levels of fraud. That is, when electoral data are heavily distorted by fraud, the initial share of the vote becomes undefinable, while the adjusted QR estimate approaches to the official share of the vote. As a consequence, even the adjusted QR estimate may contain some share of fraud in the regions with high levels of electoral forgery, the regions that turn out to be "ethnic regions". In Appendix F4, I run auxiliary models that show that the positive relationship exists only at high levels of the Ethnoreligion Index and the sincere incumbent's vote.

This may occur for two reasons. First, high values of the sincere incumbent's vote (> 60%) can be overestimated (too high) because of overwhelming influence of fraud. Second, the level of sincere incumbent's support can be in fact higher in the strongly ethnic regions. To test which one of these suppositions is true, I run auxiliary models gradually deleting observations with large amount of electoral fraud measured by the mean cluster of fraud in the region. If highly fraudulent observations are deleted, the effect of the Ethnoreligion Index actually weakens and eventually becomes insignificant, yet this occurs only after several other variables have lost their significance. This implies that the sincere incumbent's vote is in effect somewhat higher in strongly non-Russian and non-Christian Orthodox regions irrespectively of the fraud-related error in the dependent variable. At any rate, we should keep in mind that the relationship between regional ethno-religious identity and the sincere voting for the incumbent is not monotonic and not constant over time. It does not exist in the election year of 2000, it exists only at high levels of the sincere incumbent's vote (> 65%) in 2004 and 2008, and, surprisingly, the relationship is monotonic within the entire range of observations and relatively strong (bivariate OLS model's $R^2 = 0.312$) in 2012 (see Appendix F4).

To conclude this section, the most important finding is that the analysis of the sincere incumbent's vote does not find support for the hypothesis on patronage voting. Sincere voting for the incumbent is explained by a combination of socioeconomic variables, which have theoretically expected effects on the vote, and by regional ethno-religious identity – regions with high shares of non-Russian and non-Christian Orthodox populations demonstrate stronger sincere electoral support for the incumbent. However, these results should be viewed with some reasonable degree of caution inasmuch as statistically and substantively perceptible effects of socioeconomic variables appear only in multivariate models, while the effect of ethno-religious identity, even though it withstands several robustness tests, is not monotonic in election years 2004 and 2008 and not significant in 2000.The latter finding is only in partial correspondence with the previous research suggesting that once the variable of the official incumbent's vote is adjusted by the amount of electoral fraud in a more accurate manner, the relationship between the regional ethno-religious identity and sincere voting for the incumbent turns out to be not as strong as the previous research suggests. More broadly speaking, the strict differentiation between electoral fraud and the sincere vote allows to conclude that the regional ethno-religious identity influences electoral fraud to a much greater extent than it affects sincere voting for the incumbent. In other words, the high level of the officially reported incumbent's vote in the ethnic regions is the result of electoral fraud perpetrated by the ethnic elites rather than the outcome of genuine popular support by ethnic minorities. These two different effects of the ethno-religious identity were amalgamated in the previous studies that were incapable of distinguishing them without having precise instruments of election forensics.

Conclusion

This chapter provides the evidence on political consequences of distributive politics under electoral authoritarianism. The analysis of consumption of federal transfers has shown that, as the authoritarian regime progresses over, time the state bureaucracy as a part of the elite clientelist coalition begins to divert more transfer money in its own favor compared with that for teachers and doctors as members of the mass patronage coalition. This contrasts with the situation of the early 2000s when transfer funds in regional budgets were consumed in roughly equal proportions by the elite and the general public. It has also been shown that the politicized central transfers in combination with spending to the regional bureaucracy determine electoral fraud, persecution of the media and generally have a detrimental impact on the level of political and civil liberties in Russia's regions. That is, distributive politics and authoritarian practices perpetrated by political elites appear to be interdependent creating, thereby, a vicious circle of authoritarian political economy. On the demand side, authoritarian incumbents strive to improve their electoral performance and to secure loyalty of political elites by means of the central transfers allocated to the regions conditionally on election results. On the supply side, regional elites signal their loyalty in order to receive larger transfers by providing electoral fraud, repression of the opposition, persecution of the media and other intrinsically authoritarian practices that bias the electoral playing field in favor of the incumbent.

In line with previous studies, the analysis in this chapter has detected a strong effect of regional ethno-religious characteristics on electoral fraud. However, in this study, I argue that ethnicity matters in determining fraud not by facilitating monitoring of the ethnic vote (Hale 2007), since the analysis of electoral fraud in Chapter 4 has shown that vote buying and voter coercion are relatively rare practices in the Russian presidential elections compared with deliberate vote miscount. For the same reason, voter mobilization through ethnic networks (White 2016: 1134) is especially irrelevant in the ethnic regions, where extreme levels of electoral fraud indicate that electoral data are not of real-world but rather of fully artificial origin. Ethnicity does also not matter through "the [United Russia] party's capacity to engage in reliable patronage-based relationships, where the party delivers political and economic benefits in exchange for the delivery of electoral support" (White 2016: 1134) so long as United Russia does generally not distribute any sizable amount of goods to votes neither in the form of patronage, nor in the form of vote buying, irrespectively of ethnicity. The analysis of sincere incumbent's vote did also not find support for the hypothesis put forward by Bader and Van Ham (2015: 524) that "electoral manipulation is simply more needed in these [non-Russian] regions as genuine political support is lacking". Voters' identity in non-Russian and non-Christian Orthodox regions has rather a slightly positive impact on the genuine vote for the incumbent.

Instead, the results of this chapter imply that, first, not the dominant regional ethnicity and religion matter for determining electoral fraud but particularly political elites that govern non-Russian and non-Christian Orthodox regions. Regional political elites and their local agents are personally and primarily responsible for perpetration of electoral fraud and other substantively authoritarian practices. Second, the regional ethno-religious characteristics do not have an effect independently of the central transfers but these variables are inextricably interrelated. Namely, when Putin came to power, the federal center reached an agreement with the ethnic regions, which were formerly in opposition to the center, that they will be rewarded by larger central payments for their loyalty. And these regions turned into main suppliers of electoral fraud for the incumbent.

Finally, contrary to theoretical expectations, the analysis of the sincere incumbent's vote has provided no empirical evidence of patronage voting. First, the analysis of consumption of federal transfers has shown that political leaders prefer to deliver benefits to political elites in expense of voters under consolidated electoral authoritarianism. At the first glance, there is no obvious rationale of why authoritarian incumbents prefer elite loyalty over mass loyalty. Elites can falsify election results as well as voters can vote for the incumbent. Discontented elites can challenge the incumbent in elections or arrange a *coup d'état*. Disaffected voters can similarly vote against the incumbent or depose him in a "color revolution".

To disentangle this puzzle, assume that political leaders are typically risk-averse, meaning, in particular, that they minimize the strongest potential threat to their rule in the first place. If this threat comes from the side of masses in the form of popular protest or a low level of electoral support and elites cannot credibly eliminate this threat by means of electoral fraud and repression, the incumbent has a strong incentive to resort to distributing benefits in the form of patronage in order to pacify the masses. If the threat comes from the side of the elites and masses cannot credibly neutralize it by strong incumbent's support, the incumbent has more incentives to distribute more benefits toward the elites. In reality, however, these "pure" types of conflict are relatively rare but the threats come simultaneously from both sides. Yet the threat-neutralizing potential of masses looks much more modest than the threat-neutralizing potential of elites. While loyal police and military forces can easily suppress popular demonstrations in most of cases, to prevent an elite's attempt to overthrow the dictator in a *coup d'état*, for example, the genuine dictator's popular support should be high to such an extent that members of the elite to be convinced that they will be torn to pieces or at least ousted abroad by indignant crowds, even if the coup will be successful. Few dictators or none at all, taking into consideration their routinely terroristic methods of governance applied against the society, can deserve such popular allegiance. Therefore, the most common situation, as Svolik (2012: 5) notes, is that "the predominant political conflict in dictatorships appears to be not between the ruling elite and the masses but rather among regime insiders." Highlighting the importance of conflict between regime insiders having the access to state spoils and outsiders that are "left to languish in the wilderness", Bratton and Van de Walle (1994: 464) also point out that former regime insiders pose a serious threat to leaders of neopatrimonial regimes: “it is striking how commonly opposition in Africa today is led by former insiders who have fallen out of official favor.” Thus, by the nature of authoritarianism, political leaders are primarily motivated to distribute benefits to the elites in order to secure their loyalty.

Second, not only does the incumbent distributes less benefits to voters but it also follows from the analysis that these benefits do not entail sincere voting for the incumbent. This result raises a conceptual question. What does explain sincere voting for the incumbent under electoral authoritarianism? The socioeconomic correlates that demonstrated significant effects on the genuine incumbent’s vote in this chapter might potentially give an answer. However, they can neither quantitatively nor substantively account for incumbency survival. While electoral fraud varies from 2.0% (the 5th percentile) to 22.2% (the 95th percentile) in 2000–2012 and the variables of clientelism do a good job in explaining this variance and the substantive meaning of the effect is also not dubious: if the system of material rewarding for political loyalty is dismantled, the ethnic regions will more likely perpetrate fraud against the central incumbent and revive the practices of ethnic separatism, the sincere incumbent’s vote varies, accordingly, from 49.4% to 67.7% and its determinants can explain only some share of variance in between. That is, the variance of the sincere incumbent’s vote never approaches the level of electoral defeat. Substantively, the most socioeconomic variables cannot be manipulated by the incumbent as easily as the variables of clientelism.

Thus, sincere voting for the incumbent still remains puzzling under electoral authoritarianism. As an avenue for further research, I offer a possible solution to the puzzle in Appendix F6 by looking at the problem from another perspective. Trying to explain electoral behavior in a spectrum of political regimes from electoral democracies to electoral authoritarianism, scholars for more than fifty years employ the notions of patronage and clientelism the origins of which trace back to Ancient Rome. Emphasizing the ability of modern-day patrons to secure loyalty of their clients via various material benefits, researchers disregard, however, the fact that Roman emperors secured loyalty of masses by a combination of stimuli known as “bread and circuses”. In Appendix F6, I strive to fill this gap by bringing “circuses” back into the explanatory model. With respect to findings of this study, it is no exaggeration to say that, in the combination of “bread and circuses”, Putin’s regime keeps voters on a starvation ration but generously shows various “circuses” on television, whereas nearly all “bread” is transferred to political elites.

Chapter 7. Conclusion and Discussion

In this dissertation, I have argued that authoritarian incumbents gain and retain power through a combination of various legal and illegal practices, including electoral fraud, persecution of the mass media, and repression of opposition forces. At the same time, distributive politics is a key to understanding electoral authoritarian dominance. Not only have authoritarian incumbents to distribute benefits to voters, as their democratic counterparts have to do, but they must also invest in political elites to secure their loyalty, which is subsequently converted into various authoritarian policy outcomes that allow authoritarian leaders to stay in power and to maintain the regime. This argument has been tested using the data from Russian regions with especial focus on electoral fraud as an intrinsic inextricable element of authoritarian politics and the allocation of the federal transfers as an element of distributive politics. The final part of the dissertation discusses the main theoretical findings in the context of the existing theories of authoritarian dominance.

The Role of Electoral Fraud under Electoral Authoritarianism

The quantitative examination of the extent of electoral fraud in the Russian 2012 presidential election has shown that, in line with theoretical predictions for electoral authoritarianism, falsification of the vote in favor of the incumbent was widespread but generally not outcome-changing. However, conditions surrounding the perpetration of electoral fraud and its consequences pose several theoretical challenges. Magaloni (2006: Ch. 8) argues that uncertainty about the extent of electoral fraud impelled moderate PRI's opponents to abstain from post-electoral protests and to abandon those opposition parties that were engaged in post-electoral battles, thereby legitimizing the PRI's dominance. The Russian experience of post-electoral protests in 2011–2012, however, shows that though public awareness of electoral forgery appeared as a result of the electoral oversight undertaken by thousands of electoral observers indeed triggered large-scale mass protests, which lasted throughout the period between the parliamentary and the presidential elections, the scale of protests quickly came to naught as soon as the voters and the opposition activists learned from the copies of polling station protocols that Putin could have won even without resorting to fraud.

Moreover, the Russian case may be deemed a natural experiment that shows a crucial difference in the scope of protest between nearly/or outcome-changing fraud, as occurred in the parliamentary election of 2011, when United Russia received 34.3 percent of the vote on average, 32.5% in Moscow, was defeated by Just Russia in Saint Petersburg and Novgorod Oblast (having received 26.2% versus 29.2% and 28.7% versus 31.3%, respectively) and by KPRF in Nizhegorodskaya Oblast (23.7% vs. 34.8%)[159], and fraud at the margin in the presidential election of 2012, when Putin's official vote share (63.6%) was not much larger than reported by electoral observers – 54.3% (Combined Protocol 2012), 51.3% (SMS-CIK 2012) and both exceeded fifty-percent threshold. In the first case (nearly/or outcome-changing fraud coupled with public awareness), electoral fraud had engendered a strong wave of post-electoral protest. In the second case (fraud at the margin coupled with public awareness), this wave had crashed against the rocks of futility. Hence, even if the uncertainty about the scope of electoral fraud hinders post-electoral protests, mass awareness of the electoral fraud does not necessarily translate into protest. It happens only in that case, when the voters perceive the incumbent as vulnerable to electoral defeat. Conversely, mass awareness of the real election outcome may negatively influence the propensity to protest if voters learn from trustworthy electoral monitoring that the incumbent had won with a huge margin and that electoral fraud had only bolstered an already impressive victory.

This evidence partially contradicts Simpser (2013: 24–26) who argues that "color revolutions" typically follow after marginal electoral manipulation, and that blatant and excessive electoral manipulation conveys the message to the public that the manipulator is strong. For a more precise prediction, at least three variables influencing the probability of protest should be considered: 1) information, 2) the amount of fraud, and 3) the level of true vote.[160] Indeed, the "color revolutions" in the post-Soviet area were preceded by relatively small-scale electoral manipulations. But the levels of electoral support for the incumbent candidates as well as their margins of victory were also small, indicating that the elections were highly competitive and the incumbents were vulnerable. We, however, hardly find any support for Simpser's argument if we hypothetically test it on the Russian empirics

[159] Calculations are based on RuElect (2011).

[160] In his cross-country analysis Simpser (2013: Ch. 7.3) controls only for the margin of victory by defining an election as "excessively manipulated" if the margin of victory was at least 20 percent. According to this definition, the State Duma 2011 election was evidently manipulated excessively in so far as United Russia's margin of victory over the Communist Party was equal to 30.1 percent.

by imagining that the Central Electoral Commission would have reported not 49.3 percent but 79.3 or 99.3 percent of United Russia's vote, keeping all other conditions constant, i.e., the mass public awareness of the degree of fraud and the true vote equaling to slightly more than thirty percent. Such a situation would have presumably resulted in an even more widespread protest since the voters' resentment would have been driven by a much larger number of their votes being stolen by the incumbent party.

Explaining the reasons why authoritarian leaders resort to electoral fraud beyond a simple winning of elections, scholars ordinarily underline the capacity of fraud to generate a popular "image of invincibility" (Magaloni 2006), to convey an "image of strength" to other political actors (Simpser 2013) or to [positively] influence the bureaucrat's perception of the citizen's support for the incumbent in order to neutralize bureaucratic efforts on ousting the leader (Gehlbach and Simpser 2015). Nearly no previous research asserts that electoral manipulations are almost inevitable under authoritarianism by the nature of the regime itself. A noticeable exception, however, is the study of Rundlett and Svolik (2016) who argue that "overwhelming incumbent victories are the unintended byproduct of the principal-agent and collective action problems in the political organization of electoral fraud" (p. 182). Specifically, individual agents are most willing to perpetrate fraud in a situation of the least potential costs of this action – when the incumbent is genuinely popular and the probability of criminal prosecution if the challenger were to win the election is accordingly small. Although the general intuition of this approach is correct – authoritarian regime supporters commonly tend to defect when they anticipate a defeat of the incumbent, it assumes too much freedom for local agents.

On the one hand, local agents (regional elites in my terminology) are not totally manageable by the incumbent because they have their own interests and their own capacity to perpetrate fraud. Their interests may indeed sometimes diverge from the incumbent's interests (as the authors show) but may also be strictly conditional on regime survival and, therefore, strongly tied with the incumbent's interests. Those local actors who are engaged in electoral fraud the most (such actors are typically engaged in corruption and other criminal practices as well) cannot simply defect to the opposition even when the regime is beginning to disintegrate (they can but only if a new criminal authoritarian government is assumed). They cannot also refrain from perpetrating fraud if they want to evade prosecution for their prior crimes if the challenger will win[161]. The second reason of why the extent of electoral fraud is not totally manageable by the incumbent is the variable capacity of regional elites to perpetrate fraud. Even if a governor wants to please the incumbent with the highest vote share in his region, this intention will produce null result if the bureaucracy, including electoral commissions, is impartial, observers of the opposition monitor elections, and the media and courts are independent. This crucial element is missing in Rundlett and Svolik's model.

On the other hand, the incumbent's control over local agents is provided by means of material inducements and repression. According to Rundlett and Svolik's model, "an agent who delivers 70% where the incumbent was expected to receive only 50% of the vote is rewarded more than one who delivers 90%" (p. 189). This theoretical expectation is not confirmed by empirical research. To the best of my knowledge, no inversed u-shaped relationship between central transfers and election results has been found in the literature. The analysis of federal transfers in this study has also shown that the allocation of funds was in a linear dependence from the incumbent's vote in Putin's era.[162] Rather than lesser perceived potential costs of fraud related to the level of Putin's genuine popularity[163], a broader flow of federal transfers toward Mordovia (the share of transfers in the budget in 2012 = 55.6%), Dagestan (STB = 77.2%) and Tuva (STB = 79.4%) has induced elites of these regions to falsify more votes for Putin in 2012 (the difference between the offical and the estimated vote share amounts to 25.0%, 27.5%, and 27.1%, respectively) compared with Perm Krai, Irkutsk Oblast and Tomsk Oblast, where the STB and the amount of fraud are equal respectively to: 11.7, 14.8, and 19.8 percent and 1.0, 2.2, and 2.4 percent.

If Kremlin's political strategists had considered that the excessive level of fraud threatens their dominance, they would have reduced (or just hinted to reduce) funding of these regions. Alternatively, if the system of economic rewards fails to achieve the result, authoritarian incumbents may resort to various legal and illegal

[161] Rundlett and Svolik (2016) assume that the new government will forgive all crimes of the regime functionaries. Sometimes it can take place, especially if regime transition is initiated, negotiated and controlled by the ruling elite (examples are Post-Soviet and other top-down or "pacted" (O'Donnel and Schmitter 1986: Ch. 4) transitions). In the most of cases this assumption is, however, not held since the elites find themselves to be at risk under a new regime.

[162] Due to skewness of distributions, the relationship for transfers measured in rubles and transfers per capita is exponential, yet it is not u-shaped.

[163] Rundlett and Svolik (2016: 181) atheoretically assume that agents infer the level of incumbent's genuine popularity, which influences the probability of incumbent's victory or defeat in national elections and accordingly their chances for reward or punishment, from their own *precincts* but not from nationwide results of previous elections, public polls or media messages at the national level.

tools of repression, including dismissal of members of election commissions, removal of governors from office (in 2005–2011 when gubernatorial elections were canceled) or rejection of governor's candidacy by United Russia (2011–), sudden arrests and criminal litigations[164] (special services usually collect sensitive information on most of relevant politicians and officials, furthermore, reliable evidence is not necessary for conviction by corrupted courts), blackmail or assassination as the last resort. Therefore, the degree of freedom of local agents, who can deliberately undersupply or oversupply fraud, is largely exaggerated in Rundlett and Svolik's model.

The role of bureaucrats as the ruler's agents is also misleadingly interpreted by Gehlbach and Simpser (2015). They argue that electoral manipulation can help rulers to solve the problem of bureaucratic compliance by influencing bureaucrats' perceptions of the incumbent's popular support. This formulation, however, contains a high degree of endogeneity since the ruler cannot manipulate elections personally and independently of the bureaucracy, and therefore, not only electoral fraud may influence the bureaucrats' perceptions of the ruler's strength but the bureaucracy is also largely involved in perpetrating electoral fraud.[165] For this reason, excessive fraud is unlikely committed to convince the bureaucracy or region-level elites more broadly that the incumbent's hold on power is secure. The informational effect of fraud on elites' propensity to rebellion is rather indirect. So far as regional elites and the bureaucracy are widely engaged in the process of electoral forgery, they do not perceive huge incumbent's vote margins as an indicator of his popular support (as it is assumed by Gehlbach and Simpser) but

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[164] The most notable event occurred on 18 September 2015 when the governor of Komi Republic Vyacheslav Geizer together with other 18 top regional officials and businessmen, including Deputy Governor A. Chernov, Chairman of the State Council of Komi Republic I. Kovzel, Deputy Chairman of the Komi government K. Romadanov, and businessmen A. Zarubin and V. Veselov, were detained and taken to Moscow. Central television showed how a lock box with money, a one-million dollar wristwatch, and registration certificates of offshore companies were found in Geizer's office during the search (NTV 2015). Geizer and colleagues were arrested and accused of creation of a criminal community, which acted over ten years, and fraud with the estimated loss to the budget of over 3.5 billion rubles (about 50 million U.S. dollars). The principal activity of the group is asserted to be money laundering from privatization of state property (Azar 2015; Bnkomi 2017).
Overall, five governors were arrested from 2015 to 2017. The governor of Sakhalin Oblast Alexander Khoroshavin was detained on 4 March 2015 and accused of taking a bribe of $5.6 million. The governor of Kirovaskaya Oblast Nikita Belych was detained on 24 June 2016 during taking a bribe of 400,000 euro. Governors of Udmurtia (Alexander Solovyov on 4 April 2017) and Mari El (Leonid Markelov on 13 April 2017) were also accused of bribery and discharged from office.

[165] In particular, members of electoral commissions, who are (formally) bureaucrats, are primarily responsible for the vast majority of electoral manipulations. Electoral fraud cannot also be carried out without permission, consent or assistance of other state bodies. Courts and the police are the most conspicuous of them. However, as it was noted in Chapter 2, even school principals and hospital chief doctors from time to time expert pressure on ordinary teachers and doctors to obtain their votes. The implementation of such policies of vote buying and voter coercion is hardly possible without engagement of the bureaucracy at the ministerial level.

rather they conclude from this fact that the incumbent possesses sufficient resources to pay for loyalty of all relevant actors associated with electoral fraud and that he is strong enough to suppress opposition dissentients.

In this connection yet from a different perspective, throughout the study I argued that the regime's commitment to fraud, even in those cases when it may seem unnecessary, can be explained by two main reasons. First, the costs of electoral defeat vary greatly by the type of political regime. In a democracy, a defeated candidate loses only the benefits associated with holding office. These benefits, however, are relatively moderate. Democratic leaders ordinarily do not extract as much rents from the state as would allow them to appropriate their own castles, yachts, jets or engage in similar kinds of luxury consumption. Authoritarian leaders can afford to do this since a lack of public scrutiny allows them to wallow deeply in corruption under crony capitalism to enrich themselves sometimes to an incredible extent. Not only corruption, but also political repression, electoral fraud and other intrinsically authoritarian illegal practices make authoritarian leaders subject to criminal investigations when a change of the regime occurs (except if a new regime, having a considerable degree of similarity and heredity, guarantees them personal immunity) and they lose everything – power, property and personal freedom. Hence, central autocrats as well as regional elites and other regime functionaries who are also engaged in various malpractices have much many incentives to cling to the regime and to sustain it by any means, including electoral fraud. They cannot allow free and fair competition to exist,[166] even if they are currently capable of winning without fraud, since equal competition undermines their chances of dominance in the future and will someday or other result in electoral defeat.[167]

[166] It should be underlined that electoral fraud should be understood in a complex with other authoritarian practices rather than independently of them. Authoritarian leaders may, in fact, forgo electoral fraud in a short run and stay in power due to repression, media bias, elite loyalty secured by means of distributive politics and corruption or mass loyalty secured by means of patronage. Nevertheless, they cannot suspend all authoritarian practices *simultaneously* without putting their dominance in jeopardy even in a situation of favorable economic and other exogenous conditions since the relaxation of authoritarian pressure would entail a backlash at each direction: repression entails resistance, electoral fraud and corruption result into criminal litigations, and the relaxation of control over the media translates into *glasnost*, that is, making crimes of the regime publically announced and giving the opposition more space for delivering their messages to voters.

[167] In a similar vein, Simpser (2013: 158–158) discusses the effect of high stakes of holding office on electoral manipulation, when more than winning matters, along with other alternative explanations of excessive electoral manipulation – uncertainty, low cost of manipulation, and the necessity of keeping the machinery of electoral manipulation "well-oiled". He aptly points out that these stakes can be of monetary form (related to corruption and embezzlement of public funds) and of non-monetary form (the possibility of lifetime jail or death on failing to win the election). However, he rejects these concerns and concludes that "the stakes of office could account for excessive manipulation only in exceptional circumstances" (p. 158). Simpser does not

Second, this study has shown that federal transfers are allocated to regions to a large degree based on electoral concerns. By doing this, the central-level incumbents aim to secure loyalty of regional elites and instigate them to implement various authoritarian policies, including electoral fraud, in order to retain power.[168] Therefore, regional elites have a financial interest in larger vote numbers for the incumbent president and his "party of power" and they will strive to falsify votes due to this material incentive until the entire system of economic rewarding for political loyalty is dismantled.[169] Put differently, electoral fraud and distributive politics are interdependent under authoritarianism. Not only do central incumbents require a higher electoral support (which can be most easily increased by fraud) by offering larger transfers to regional elites, but also regional elites demand larger transfers by supplying more fraud.[170] Such dyadic (even though hierarchical) reciprocal and mutually beneficial character of clientelist relationships is widely pointed out in the literature (Lemarchand and Legg 1972; Eisenstadt and Roniger 1980; Kitschelt and Wilkinson 2007; Hicken 2011). Since the system of clientelist exchange includes also regional elites as actors having their own interests, which must be satisfied, authoritarian incumbents cannot simply stop this system when they do not need fraud for winning office and then, once the level of their popularity

notice that the stakes of office vary by type of political regime. Moreover, he argues that the relationship between regime type and excessive/blatant manipulation is virtually absent (pp. 143–146). Similarly, Thompson and Kuntz (2007) assert fear of criminal prosecution and charges of corruption to be probably most decisive in motivating electoral theft. This study does also not specify that the level of corruption is higher in authoritarian regimes and does not consider other grounds for prosecution that are intrinsically linked to authoritarianism – electoral fraud, repression, and other illegal means of political survival.

168 The approach of Rundlett and Svolik (2016) is primarily focused on the probability of incumbent's defeat or survival in power as a condition for receiving favours by the local-level agents and touches the role of distributive politics in the system of authoritarian practices only tangentially.

169 The dissertation shows only one particular element of this system – the distributive politics of federal transfers. But looking from a broader perspective, this system consists of plenty of similar elements and mechanisms, including politically motivated employment and career promotion in administrative positions, especially those having repressive significance such as courts, the police, and electoral commissions, which penetrate the state body from the federal center to the lowest-level municipality. General corruption, which holds the regime afloat, is so pervasive that nothing useful is done: no roads, hospitals, schools, even spaceports and other objects of public infrastructure are maintained or constructed unless extra profits for state officials accountable for these activities can be gained from them. Vice-versa, everything detrimental is done as long as it provides a benefit: opposition votes are stolen; honest journalists are bribed or intimidated; opposition parties and candidates are denied access to the media, offered "pork" in exchange for docility and are not registered by the electoral commission or prosecuted as political extremists if they reject the offer – and so on and so forth.

170 It should be noted that, besides electoral fraud, the system of mutual relationships between the central incumbent and political elites includes also repression of the opposition, persecution of the media, refraining from challenging the incumbent, supporting his legislative initiatives, and other elements. In these cases, a demand for larger transfers by actively supplying these authoritarian outcomes is also expected from the side of political elites.

decreased, resume its functioning without losing loyalty of regional elites or disintegrating the entire system of authoritarian (mal)practices.[171]

Electoral Authoritarianism, Ethnicity, and Clientelist Coalitions

This study has uncovered that the central government distributed its resources in the form of federal transfers to the most electorally supportive regions, which appeared to be predominantly non-Russian and non-Orthodox Christian regions. These ethnic regions, however, were mostly rebellious during the 1990s. They declared state sovereignty, signed agreements with the federal center on the delimitation of powers, voted against Yeltsin and pro-government parties, and primarily supported the Communists. How did the regime manage to convert them from its main opponents into its prime supporters? An implication of the spatial competition theory for this case suggests that although the ethnic regions were oppositional to the federal center in the 1990s, they had not been inextricably linked with the main competitor – the Communist Party – as well as with any other political power at the federal level by ideological or other strong ties. Put differently, these regions comprised a tactical opposition group to the Kremlin; they have not been someone's core constituency. When Putin came to power, he made them a simple offer: corruption and material benefits in exchange for political loyalty, while credibly supporting the offer by applying force to those who was prone to reject it (in such cases as the second war in Chechnya and other counter-terrorist operations). Without having strong stable ties with the opposition, it was easy for the ethnic regions to accept this alluring offer and to support the incumbent. Therewith they lost nothing. Although the pattern of distribution had changed (from a negative to a positive association between federal transfers and support for the incumbent from the 1990s to the 2000s), the beneficiary group of regions remained almost the same

[171] Consider what would have happened if authoritarian leaders had decided to refrain from fraud, at least temporarily. First, they can do it by eliminating the relationship between central transfers and the incumbent's vote. In this case, the elites would have received a signal that political loyalty is not encouraged and would have inferred from it that there is no inducement to support the regime, at least in this area. Such attempt would obviously mean an act of self-destruction of authoritarianism. Second, and more realistic, autocrats can give an informal command to temporarily stop the machinery of electoral manipulations. Such ambivalent signal would imply that regional elites would have to compete for economic favours by using primarily democratic tools or sacrifice their ability to extract benefits (and extra benefits associated with holding office under authoritarianism) in these conditions. The both outcomes (a partial democratisation or a loss of elite loyalty) are subversive for authoritarianism. The consequences of demise of authoritarian rule, which will ineluctably occur if such subversive policies are implemented systematically, for political elites, are described in the main text above.

with the only difference that the ethnic regions were rewarded for disobedience (i.e., were appeased) under Yeltsin and began to be rewarded for loyalty under Putin.

At the same time, the question whether non-Russian and non-Christian Orthodox regions have become regime's core or tactical supporters is open for debate. On the one hand, a simple intuition says that these regions support Putin's regime tactically in order to receive larger federal transfers and other privileges; no ideological, ethno-religious or similar invariable characteristics bond them together. Cox and McCubbins (1986: 380) suggest that "a politician's core supporters are those who will stick with him through thick and thin", where "thick and thin" refers to the level of promised benefits. From this definition, it follows that the ethnic regions are tactical or opportunistic rather than core supporters of the regime. If they lose their benefits, they will highly likely transform into opposition groups, especially if the loss occur in relative terms, comparatively to ethnically Russian regions.

On the other hand, studies routinely report that the level electoral fraud is higher in the ethnic regions (Goodnow, Moser and Smith 2014; White 2016) and republics (Mebane and Kalinin 2009; Lukinova, Maygkov and Ordeshook 2011; Skovoroda and Lankina 2017), political ethnicity was one of the main sources that determined the success of governors' political machines in the post-Soviet period (Hale 2003). This study has also shown that the a region's ethno-religious divergence from central Russia is conducive to electoral fraud as well as to sincere vote for the incumbent and it is negatively associated with the regional level of democracy. Hence, the common denominator between non-Russian regions and Putin's regime is authoritarianism. Due to the proximity on authoritarian cleavage, it appeared easy for central elites, as Gelman (2010: 16) notes, to make use of "the opportunity to co-opt it [subnational authoritarianism] "from above" into a nationwide system of authoritarian rule".

The sources of this authoritarian proximity, of course, require further examination but they presumably include a greater mass tolerance to authoritarian practices and a larger degree of political elites' habituation to fraud, repression, corruption, and other informal political practices. When these informal practices re-emerged at the central level in the 2000s, they were supported from below in the ethnic regions, since these practices were previously more commonly practiced and tolerated in these regions. In particular, the local origins of authoritarianism may include more tolerance for corruption as a tool for solving various problems, a greater degree of susceptibility to the image of a "strong man" attributed to Putin and to the regional political leaders by the official media, and a lesser ability to evaluate politicians based on the outcomes of their policies rather than on their tempting and deceptive declarations.

In Cox and McCubbins's (1986) model, the amount of promised benefits by a candidate crucially depends on the degree of responsiveness of a group: unresponsive (opposition) groups should be promised little while responsive (swing and support) groups – relatively more. The proximity of the ethnic regions on authoritarian cleavage with the incumbent makes them more responsive to the regime's clientelist appeals compared with ethnically Russian regions. The question about the responsiveness of ethnic and religious minorities for forging the incumbent's clientelist coalition can be addressed by simply considering what would have happened if Putin had decided in the early 2000s to provide benefits primarily to ethnically Russian regions while withdrawing funds from the North Caucasian and other ethnic republics. Non-Russian regions would more likely have continued and reinforced the practices of sovereignty declarations, tax avoidance, boycotting of federal elections and similar secessionist policies that would obviously have entailed high costs for the central authorities. However, these costs would have hardly been compensated by political returns from ethnically Russian regions. Neither would Russian voters have been so pleased by the larger transfers that it would have induced them to increase Putin's vote and turnout rates by twenty percent, nor would the elites of these regions have been capable of falsifying the incumbent's vote up to nearly a hundred percent.

Electoral Authoritarianism and Distributive Politics

The analysis of the consumption of transfers has revealed that as the authoritarian regime is getting more established and consolidated over time, it becomes less rent-sharing with respect to the general public. Instead, it primarily distributes its resources to political elites in order to secure their loyalty. This type of distribution is more consistent with state exploitation or state predation, as vividly depicted by Grzymala-Busse (2008). Describing the designation of development programs in clientelist and predatory regimes she notes:[172]

[172] However, Grzymala-Busse (2008) codes Russia under Putin as a clientelist (i.e., highly distributive) regime. I admit that in a cross-country comparison the Russian regime may look more distributive than the predatory

> "[h]owever they are contingent or inefficient, such programs [in the distributive regimes] nonetheless deliver benefits to constituents. [...] In contrast, predatory regimes with large agricultural sectors use development programs largely to channel funding into the pockets and accounts of the rulers. There is little pay-off to either targeting or delivering these programs to their intended constituencies, narrow or broad. [...] Where agricultural and infrastructure programs in rent-sharing regimes deliver benefits to local supporters, predatory versions of similar programs divert funds into the pockets of ruling elites at the national level, before distribution can take place" (p. 663).

The declining magnitude of mass patronage in Russia also raises a question about the relationship between competition and distribution in autocracies. Grzymala-Busse (2007) found that robust electoral competition has limited rent-seeking practices of governing parties in post-communist democracies.[173] Can this finding be extrapolated to authoritarian regimes? The dynamics of Russian distributive politics offers rather a positive answer to this question. And even though extensive welfare programs may be found in several closed authoritarian regimes – such as Muammar Gaddaffi's Libya or the Soviet Union – there is an empirical ground to consider that in trivial autocracies, which are not constrained by any ideological doctrines, incumbents are primarily concerned with securing elite loyalty, especially in hegemonic regimes, which tolerate only a tightly controlled and limited opposition in elections.

More broadly, findings of this study contribute to the debate on distributional consequences of different political regimes (Boix 2003; Acemoglu et al. 2015) by revealing the mechanism that engenders social inequality under electoral authoritarianism – the vital necessity by authoritarian leaders to pay for loyalty of political elites. Authoritarian leaders have more incentives relatively to their democratic counterparts to take loyalty of political elites seriously. First, if channels of electoral competition are clamped or closed, discontented members of the elite have basically two options for political change in the country – they may overthrow the dictator in a *coup d'état* or initiate a "color revolution" from below; as an intermediate measure, they may commit sabotage of incumbent's political decisions. Due to high potential costs of these measures compared with participation in elections, unconstitutional means of power change can be used

regimes of Marcos in the Philippines, Abacha in Nigeria or Mugabe in Zimbabwe. In any case, the Russian regime is becoming less distributive to voters within its own temporal magnitude.

[173] Elsewhere, Grzymala-Busse (2008) does not differentiate between types of political regimes; her sample includes also electoral democracies, such as Italy, Japan, and Poland.

only as the last resort in democracies. In authoritarian regimes, the violent ouster from power is the Damocles sword of dictators. Second, authoritarian leaders cannot repress their opponents, perpetrate electoral fraud and other authoritarian practices personally, they need assistance of elites for these purposes. Due to high potential costs of authoritarian practices, elites will barely provide their services to the incumbent gratuitously. Furthermore, disloyal authoritarian elites, as the spread of the ethnic separatism in Russia's regions in the early 1990s shows, can turn their political machines against the incumbent.

In contrary, authoritarian incumbents have few incentives to invest in patronage of masses, especially if the authentic level of incumbent's mass support is high, if masses cannot credibly threaten the stability of the regime by means of popular protest or supporting the opposition, and if electoral competition is tightly restricted and nearly meaningless (in hegemonic autocracies). Even if the popular threat to the regime is credible, authoritarian leaders may still prefer to invest more in elites (by raising salaries to the police, the military, and the secret services and giving them wider discretionary powers, delivering side payments to potential elite defectors for their acquiescence, and bribing popular opposition leaders), in order to provide more repression for counteracting the popular threat. Therefore, authoritarian leaders should encounter rather a rare historical situation to distribute benefits to voters seriously.

Although this study is mostly focused on the regional elites as primary beneficiaries of the federal transfers and shows that these funds pursue the goal of buying elite loyalty, which is eventually converted into various authoritarian outcomes, including electoral fraud, its findings can hypothetically be extended to the nation-level elites. It is a well-known fact that, after coming to power, Putin put his cronies into the key positions in the economy and polity. The argument developed at the regional level suggests that not only did these persons, who subsequently became known as "oligarchs" or influential politicians, enriched themselves from corruption but their loyalty secured through illegal or politically contingent means also contributed to the strengthening of autocracy. A much discussed inquiry by Morar (2007) revealed that big state companies and controlled businessmen were compelled to pay a "tribute" to what she called the Kremlin's "black cashbox". The moneys were then channeled into electoral funds of political parties – not only to United Russia but also to those opposition parties that are affiliated with the regime. In this regard, Putin only continued the vicious practice initiated in Yeltsin's times. An apotheosis of the presidential campaign of 1996 has become the detention of two Yeltsin's activists at the entrance of the House of Government who were trying to took out of the building $538,000 in cash (Gelman 1998: 158–159). In the time of Yeltsin, however, these practices have not been "the only game in town", they were resisted by several members of the elite, including Alexander Korzhakov, the Head of the Presidential Security Service, who came into conflict with Yeltsin over this case and was eventually sacked (Korzhakov 1997: Ch. 1), and the low state repressive capacity made incumbent's threats to businessmen not credible, rather it was the politics of concessions of the Kremlin to oligarchs. In the time of Putin, the opposition between the oligarchs has been exterminated (the cases of V. Gusinskiy, B. Berezovskiy, and M. Khodorkovskiy) and the oligarchs' access to state funds and the very opportunity of doing business has become conditional on political loyalty. In any case, using of such "black cashboxes" donated by business elites as well as the (semi)legal use of public money on political discretion allow the incumbent to outspend competitors in electoral campaigns, to support "spoiler" parties, to buy off non-affiliated opposition candidates or to bribe state officials, creating, thereby, hyper-incumbency advantages.

Thus, not simply the political and economic elites are corrupted and disproportionately rewarded under electoral authoritarianism, they are purposefully corrupted and deliberately rewarded to subsequently respond for their access to state spoils with political loyalty to the incumbent, which takes multiple forms, such as refraining from challenging the incumbent, perpetration of electoral fraud and political repression against opposition groups or cutting off financial flows to the opposition and paying "tributes" to the incumbent and his political affiliates.

However, the disproportionate rewarding of elites relatively to masses raises another question: why does mass political support appear to be not such a rare phenomenon in electoral authoritarian regimes and especially in Putin's Russia? This study has examined the effect of politicized federal transfers and other variables of patronage spending on the sincere incumbent's vote, yet, contrary to theoretical expectations, no evidence was found to support the hypothesis of patronage voting. Instead, it was found that the level of sincere incumbent's vote is somewhat higher in regions with large proportions of non-Russian and non-Christian Orthodox populations, that is, in the so-called ethnic regions that are also characterized by higher levels of authoritarianism. In this relation, one answer to the question on popular support for authoritarian incumbents can be drawn from a viewpoint on public opinion under authoritarianism as a product of biased delivery of information by the manipulated mass media, the limited ability of opposition parties to convey their messages to the public, and repression of dissenters. All these facts are true, indeed. Nevertheless, the stronger the authoritarian pressure, the more powerful backlash in the form of public discontent with authoritarian practices is expected to follow against it. This is what Greene (2008) calls the “cross-cutting regime cleavage”, that is, a demand for the openness of the electoral arena, good governance, eradication of corruption, and democratization in general. This cleavage is advantageous exclusively to the opposition since the authoritarian incumbent cannot offer a more level playing field. Even though Putin’s regime imposes higher costs on political participation compared with fully competitive systems, it is not Stalinism or a similar kind of closed autocracy severely exterminating any discontent. In other words, electoral authoritarianism in Putin’s Russia is generally permissive of forming political parties, participating in political meetings (including post-electoral protests), and disseminating information via the social networks or on the internet. Notwithstanding, political parties that are not affiliated with the incumbent attract very few supporters; protests occur on *ad hoc* issues, rarely find mass support and are not transformed into broader social movements or political platforms; and the mostly important, the general resentment with authoritarian practices is either weak or absent in the society.

Besides that, in Putin’s Russia, voting is not compulsory and elections are not uncontested as it used to be in the Soviet Union, for example. Nevertheless, the analysis of electoral fraud in this study has shown that about fifty percent of the eligible voters came to the polls and 57.6 percent of them voted for the incumbent more or less sincerely in the presidential elections of 2000–2012, on average; the level of the authentic vote for the incumbent has been below the 50-percent threshold (47.3%) only in the election of 2000. Why do the voters, when coming to the polls, not punish incumbents for sliding into authoritarianism so as they typically punish them for economic slumps? Is this issue not salient for them? Are they completely unaware of what is happening in politics? Examining the dynamics of public opinion concerning perceptions of the political regime in Russia, Whitefield (2009) found that evaluations of democracy and several aspects of democracy were surprisingly stable over time and almost statistically indistinguishable from 1993 to 2007, while there is a broad consensus between scholars and experts that Russia has undergone an authoritarian transition under Putin. Trying to explain this discrepancy, Whitefield considered several explanations but he finally concluded that this question is difficult to answer and calls for further investigation. Thus, the popular support for electoral authoritarianism still remains puzzling. To tackle this problem, I offer a possible explanation based on the theory of motivated reasoning in Appendix F6, which suggests that voters adhere to biased information delivered by the incumbent-controlled media and prefer it over unbiased information since state-sponsored propaganda minimizes psychological costs of perception of the reality relatively to true information.

The Limitations of the Study and Avenues for Further Research

As it was noted earlier in Chapter 1, the main argument has rather been tested throughout the study in its minimal version. Many issues of authoritarian survival have not been explicitly addressed and deserve further examination. In this final section, I point out the most important of them.

Although this study is primarily focused on electoral fraud as an authoritarian outcome of political loyalty of regional elites and it has additionally examined the effect of politically determined transfers on media freedom and the general level of regional democracy, the argument can also be studied in application to other authoritarian policy outcomes – repression of the opposition and refraining from challenging the incumbent by loyal regional elites. The latter authoritarian policy outcomes have not been included in the study due to complexity of their operationalization. The refraining from challenging is an intrinsically latent variable. We cannot observe the act of refraining from challenging as such until a governor or a mayor has revealed his support for the opposition by nominating his candidacy under the label of an opposition party, for example. However, such explicit electoral confrontation is rare in consolidated authoritarian regimes. The struggle for power more frequently takes behind-the-scenes forms. As a consequence, we can learn from public sources that, for instance, a governor was taken into custody and accused of corruption. But we may only speculate whether the real cause of detention is corruption or the governor was punished thereby for his informal negotiations and agreements with the opposition on donations, providing (too much) space for public meetings or mediating relationships between the business and the opposition.

The repression of the opposition manifests itself more openly. Nevertheless, repression, similarly to persecution of the media, is an interaction between strength of the opposition, strength of the regime, and time. If regime's repressive capacity is high and the opposition is initially weak, the opposition has already been or will be exterminated in the nearest future as in regions like Tatarstan, Bashkortostan, and

Mordovia, for example, and there will be no need for repression due to the absence of the object for repression (similarly, the number of per million reported incidents with journalists – the media persecution index – is equal in these regions, respectively, to 8.7, 12.5, and 20.3, whereas the country's mean is equal to 29.5). If regime's repressive capacity is high and the opposition is strong, the conflict may take a form of ongoing civil war with numerous incidents of harsh repression (as in Ingushetia, for example, with its 167.0 reported incidents with journalists per million). The rate of repression, however, is also expected to be high if regime's repressive capacity is modest and the opposition is highly developed (in Moscow and Saint Petersburg, for instance, values of the media persecution index are equal to 70.3 and 63.3, respectively). All these measurement-related problems require to be tackled in a more detailed study.

Apart from this, scholars on political repression differentiate between two types of repression – violations of personal integrity (repression in a narrow sense) and restrictions on civil liberties (Davenport 2007; Escribà-Folch 2013). While using restrictions on civil liberties as a subtype of repression rather implies conceptual stretching, legal restrictions on electoral competition belong to the same policy domain as repression (i.e., compulsion, as opposed to two other domains – distribution of material benefits and provision of information), yet unlike repression, legal restrictions on competition pursue the aim of eliminating competitors without violation of law. Both these practices may work in combination. Although electoral rules are almost constant throughout the country, Russia's regions show a considerable variation in the outcomes of electoral competition restriction. In the regional legislative elections held from 2008 to 2012, 26.3% of applied opposition candidates were not allowed to run in the election, on average. This proportion varied from 5.3% to 55.8% and the standard deviation of 10.1% between the regions. And the range of non-registered candidates was larger for candidates not affiliated with major opposition parties represented in the State Duma: from 7.7% as the minimum to 88.4% as the maximum and 47.3% on average with the standard deviation of 18.4%.[174] This and similar indicators can be used to gauge legal restriction of electoral competition in gubernatorial and legislative elections in Russia' regions.

This study has examined only clientelism as a formal practice of the distribution of benefits to political elites. Several informal practices, however, can be also

[174] Author's calculations based on the data from the Central Electoral Commission.

employed by authoritarian leaders to secure loyalty of political elites. As indicated in Table 1.3, they include two major types of political corruption – direct bribery and indirect bribery in the form of incumbent's consent for embezzlement of public funds by the elites (the elites can also squeeze money from the private sector of the economy in the form of kickbacks but this type of corruption is presumably less appropriate as a reward for loyalty due to scarcer opportunities for incumbent's control over the thflow of benefits). Direct bribery by its very nature is unobserved and it can hardly be accounted for in a quantitative research. The other form of elite corruption – misappropriation and embezzlement of public funds – is fortunately more observable inasmuch as the information on public investment becomes increasingly available. In the case of Russia, it is mainly available on the website of state procurement – http://zakupki.gov.ru. Similarly to studying of electoral fraud, the objective data are expected to be more reliable than expert indices of corruption. Regardless of the measure of corruption being used, the following research questions should be addressed. Do mostly corrupted officials demonstrate more allegiance to the incumbent? If yes, in what forms does their loyalty manifest itself? It is important to note that political corruption can definitely be not associated with loyalty to the incumbent but pursue only the goal of personal enrichment by public officials, especially in non-consolidated authoritarian regimes where incumbents do not dispose sufficient instruments for controlling elite behavior. Yet if incumbent's control over elites is assumed, as in Putin's Russia, does the incumbent punish those officials that extract benefits from corruption but not respond with loyalty? In other words, do corruption investigations concern primarily those officials who "take too much but give too little"?

It should be noted with respect to all abovementioned authoritarian practices that they are not associated with the central incumbent as closely as electoral fraud and central transfers. Therefore, repression, for example, can signalize loyalty of regional law enforcement agencies or criminal structures to regional governors in exchange for side payments or common corruption affairs, but not loyalty to the central incumbent. Such nuances require proper selection of the level at which the exchange of material benefits for political loyalty occurs.

Finally, this study has shed light chiefly on political behavior of elites under electoral authoritarianism, whereas electoral behavior of masses has not been equally accounted for on empirical grounds. Contrary to the literature that conflates clientelism with vote buying and voter intimidation (Magaloni 2006; Stokes et al. 2013; Nichter 2014), this study has suggested that patronage distribution should be legal and, more importantly, leave a room for a sincere vote. Notwithstanding these theoretical expectations, no significant effect of the politically motivated federal transfers and the variables of social spending was found on the sincere incumbent's vote. Furthermore, the detailed examination of electoral fraud has also shown that vote buying and voter intimidation are scarcely sued in Putin's Russia relatively to manipulations with vote count, which allow to boost the official vote share of the incumbent more effectively and less costly if the process of vote count is not monitored and Themis in courts appears so blind that she closes her eyes to thousands of verified copies of polling station protocols showing discrepancies with the officially reported numbers of votes. Another stand of the literature stresses the informational role of clientelism and finds that brokers distribute benefits to voters to signalize them electoral viability of the candidate (Muñoz 2014; Zarazaga 2014; Kramon 2017). In the case of Russia, we do also not find such grounded in the local society brokers that distribute social benefits from the municipality, a candidate or the dominant party office to voters. Thus, mass patronage turns out to have no effect on sincere voting for the incumbent in any of existing definitions.

It can be argued that such poor account for voter behavior from the patronage-related perspective results merely from an individual specificity of Russia's political situation. However, election-related handouts to voters were also widespread in Russia in the 1990s until the early 2000s before the authoritarian consolidation has occurred. Since then, electoral campaigns have become much more routine, unremarkable and media-based. In the late 1990s, while studying in school, I discussed (mainly ironized and spoiled) with my school mates candidates' electoral booklets that were available in abundance and took even notice such original kind of electoral advertisement as aerosol-painted slogans on the snow. In the presidential campaigns of 2012 and especially of 2018, an external observer could only notice political posters placed sparsely between commercial advertisements, about a half of which just called for turn out to the election.

Besides that, the recent studies stressing the informational role of clientelism examine the relationships between brokers and voters in electoral democracies (contemporary Argentina and Peru) that are much more similar to Yeltsin's Russia, in which the informational theory of broker-based patronage could work, than to Putin's Russia, where multitasked brokers as trustworthy neighbors and even ordinary vote buyers are so rare that they probably outnumber those who would like to sell their votes for some benefit. Contrary to electoral authoritarian regimes, electoral competition in electoral democracies is tighter and each individual vote is more valuable since it cannot be effectively substituted by electoral fraud or repression of viable political competitors. In this connection, delivering of politically contingent benefits to voters seems to be a more rational strategy under electoral democracy than under electoral authoritarianism, and the Russian political experience from the 1990s to the 2000s confirms it. Therefore, it is reasonable to suppose that the case of Russia is not entirely unique and we will more likely find a little relevance of patronage voting in other consolidated authoritarian regimes. At any rate, the puzzle of popular support under electoral authoritarianism still calls for further examination.

Appendixes

Appendix C. Supplementary Materials to Chapter 3

Appendix C1. Cross-regional descriptive statistics for polling stations with electronic vote count and without

Table C1. Descriptive statistics for polling stations with electronic vote count and without by region, the Russian presidential election of 2012

	N of Eligible Voters, million	N of Precincts	N of KOIBs or KEGs	Mean share of UIKs with KEGs or KOIBs in a TIK	Overall		KOIBs & KEGs		Other UIKs in TIKs with KOIBs & KEGs	
					Putin V_i^l/V_i	Turnout	Putin V_i^l/V_i	Turnout	Putin V_i^l/V_i	Turnout
Altai K.	1.96	1862	100	.17	57,9	59,3	54,9	59,7	54,7	58,1
Amur O.	.66	783	40	.24	63,6	59,6	57,4	56,4	58,4	56,1
Arkhangelsk O.	.99	984	53	.37	58,5	57,6	50,7	60,0	58,0	54,3
Astrakhan O.	.77	586	35	.08	69,6	55,5	59,6	60,3	71,3	55,0
Belgorod O.	1.21	1250	61	.33	60,0	73,5	55,3	70,1	55,2	70,6
Bryansk O.	1.05	1124	58	.05	64,7	66,3	63,0	64,4	64,5	67,3
Vladimir O.	1.20	940	49	.28	54,2	52,4	54,9	53,7	61,2	52,2
Volgograd O.	2.00	1653	85	.45	64,0	63,2	61,1	63,4	66,8	69,6
Vologda O.	.99	1040	100	.36	60,1	61,0	56,9	61,2	57,1	61,2
Voronezh O.	1.92	1680	84	.14	62,0	67,3	54,5	62,8	56,8	62,6
Moscow	7.31	3386	250	.80	47,9	56,9	49,0	58,8	41,7	58,4
Saint Petersburg	3.85	1937	120	.92	59,6	61,2	56,1	59,3	72,1	73,3
Jewish A.Ob.	.14	144	8	.19	62,5	57,6	57,5	58,4	59,2	55,5
Zabaykalsky K.	.83	955	50	.22	66,4	59,3	62,7	63,0	63,3	59,2
Ivanovo O.	.87	717	110	.48	62,5	59,3	61,6	56,5	66,1	60,9
Kabardino-Balkar R.	.53	356	18	.05	77,7	73,0	79,7	77,1	77,7	72,8
Kaliningrad O.	.77	551	27	.14	53,2	58,6	46,3	61,3	48,0	59,9
Kaluga O.	.80	723	37	.25	59,8	62,7	56,2	58,4	56,5	58,8
Kamchatka K.	.26	323	18	.21	60,6	60,3	57,4	58,0	59,1	56,8
Karachay-Cherkess R.	.32	246	13	.05	91,6	91,1	82,4	89,4	92,0	91,2
Kemerovo O.	2.08	1718	87	.12	77,9	78,3	75,5	84,4	79,1	82,2
Kirov O.	1.13	1211	66	.19	58,6	60,6	55,7	60,0	56,9	59,5
Kostroma O.	.57	623	35	1.0	53,2	60,9	54,2	61,1	–	–
Krasnodar K.	3.80	2713	132	.05	64,5	69,9	60,5	68,3	64,8	70,1
Krasnoyarsk K.	2.19	2174	112	.24	60,9	58,7	56,6	58,5	56,7	58,4
Kurgan O.	.75	1175	59	.24	64,0	63,6	56,9	63,3	60,5	57,7
Kursk O.	.95	1153	61	.30	61,1	63,3	55,7	59,6	55,9	59,8
Leningrad O.	1.28	989	49	.45	62,7	62,4	60,8	59,1	62,3	57,0
Lipetsk O.	.95	875	46	.31	61,8	64,8	54,5	62,7	54,4	59,7
Magadan O.	.12	103	7	.14	56,9	58,3	52,4	56,4	53,6	57,2
Moscow O.	5.78	3388	167	.19	57,8	60,3	54,8	61,7	58,3	62,5
Murmansk O.	.67	622	31	.08	60,8	59,7	58,1	54,4	59,5	59,2
Nizhny Novgorod O.	2.78	2331	119	.64	64,5	66,3	55,4	55,9	60,1	65,8
Novgorod O.	.53	545	28	.32	58,6	58,0	53,5	58,2	53,2	58,7
Novosibirsk O.	2.14	2032	101	.90	57,0	62,5	53,4	62,5	49,3	70,6
Oryol O.	.66	749	40	.29	53,4	67,3	47,7	66,2	48,6	66,6
Penza O.	1.12	1149	59	.19	65,1	67,3	57,9	65,9	59,7	63,8
Perm K.	2.12	1890	95	.51	63,8	54,3	56,1	55,2	58,4	56,9
Primorsky K.	1.54	1587	77	.18	58,1	63,2	43,3	56,5	49,3	58,5
Pskov O.	.58	648	33	.35	60,3	60,5	54,7	59,0	57,8	60,4
Adygea R.	.34	264	14	.12	64,9	63,5	60,3	63,5	64,8	64,8
Bashkortostan R.	3.01	3509	178	.06	75,9	75,7	74,5	82,9	82,2	84,4
Buryatia R.	.63	836	41	.24	67,0	65,4	58,4	69,3	61,7	66,1
Dagestan R.	1.56	1899	92	.09	93,2	90,8	84,4	85,5	93,6	92,1
Ingushetia R.	.19	130	8	.07	92,1	86,2	80,8	84,9	92,5	86,1
Kalmykia R.	.21	253	15	.06	71,0	61,4	73,4	64,1	70,8	61,2
Karelia R.	.56	543	30	.24	56,1	54,7	50,6	60,2	52,1	55,7
Komi R.	.75	660	34	.33	65,9	69,1	61,7	69,8	59,0	70,0

Mari El R.	.54	552	29	.06	60,6	70,1	55,4	64,9	59,8	69,5
Mordovia R.	.65	802	45	.24	87,6	89,0	75,8	84,3	81,9	83,8
Sakha (Yakutia) R.	.61	813	41	.39	70,1	73,9	64,5	73,7	64,9	69,3
Tatarstan R.	2.87	2853	146	.11	83,3	82,4	94,8	98,0	95,2	97,1
Ryazan O.	.97	1063	55	.35	60,4	63,5	53,4	63,6	55,1	63,6
Saratov O.	1.99	1783	92	.05	71,3	65,8	67,5	63,7	71,6	65,9
Sakhalin O.	.40	445	23	.29	57,0	56,5	49,7	57,6	50,3	56,3
Sverdlovsk O.	3.53	2537	600	.45	65,3	58,1	61,9	58,5	63,7	58,5
Smolensk O.	.82	810	41	.24	57,4	58,3	50,5	60,0	53,4	57,1
Stavropol K.	1.98	1265	65	.14	65,1	59,6	61,6	59,8	66,9	64,8
Tambov O.	.88	952	52	.12	72,4	69,4	65,2	67,8	71,7	69,3
Tver O.	1.14	1259	67	.37	58,6	58,1	51,1	59,0	52,5	58,8
Tomsk O.	.79	777	110	.79	57,7	57,6	51,9	62,0	51,4	56,0
Tuva R.	1.25	1135	61	.15	68,5	68,7	68,5	66,9	71,6	70,0
Tyumen O.	1.06	1128	58	.05	73,7	78,5	68,7	79,4	73,9	78,5
Ulyanovsk O.	1.05	993	51	.35	58,8	62,9	51,6	59,5	53,6	57,7
Khabarovsk K.	1.06	833	43	.15	56,9	61,1	52,2	64,0	55,1	60,8
Khanty–Mansi A.O.	1.10	657	30	.28	67,2	63,3	64,0	56,8	64,0	56,9
Chelyabinsk O.	2.76	2245	111	.38	66,0	61,8	63,1	63,1	65,1	64,5
Chuvash R.	.95	1176	59	.54	63,3	72,5	57,1	63,0	65,3	83,0
Chukotka A.O.	.04	57	3	.14	73,7	80,4	73,6	81,6	82,9	88,7
Yamalo-Nenets A.O.	.36	211	11	.31	85,3	92,6	72,3	94,5	89,8	91,7
Yaroslavl O.	1.06	906	47	.40	55,2	62,8	57,3	58,9	62,8	64,6
Total	95.27	82261	4972	.28	63.3	67.8	58.9	62.3	68.0	68.2

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. Turnout and vote share entries are the ratios of total votes expressed in percentage points. The number of regions is equal to 71 (the number of regions in which electronic voting systems were installed). KOIBs denote to Optical Scan Voting Systems and KEGs denote to Electronic Voting Systems.

Table C1 shows a considerable variation in Turnout and Putin's vote in UIKs with and without electronic vote count across regions. The difference in Putin's vote between UIKs with KOIBs and KEGs and other UIKs within the same TIKs varies from a positive 7.2% in Moscow to a negative 17.6% in Yamalo-Nenets A.O., 16.0% in Saint Petersburg, and 11.7% in Astrakhan Oblast and Ingushetia. Besides vote and turnout shares, the table reports several statistics that allow us to estimate to what extent electronic vote counting machines are evenly distributed according to population. First, we can consider the share of UIKs with electronic voting in the total number of UIKs by region (column 4 over column 3). This share has the mean of 5.9%, the standard deviation of 2.7%, and the minimum of 4.6%. Four cases strongly deviate from the mean on the right: Sverdlovsk Oblast (23.7% – the maximum), Ivanovo Oblast (15.3%), Tomsk Oblast (14.2%), and Vologda Oblast (9.6%). If the four outliers are deleted, the standard deviation decreases to 0.4%. The second measure – the ratio of UIKs with electronic voting to the number of eligible voters (column 4 over column 1) – comes up with similar results: the mean = 5.5, the standard deviation = 2.3, the minimum = 2.7, and the corresponding outliers on the right = 17.0, 12.7, 14.0, and 10.1, respectively. The deletion of the outliers decreases the standard deviation to 1.1. These two measures indicate that, with few exceptions, regions have the number of KOIBs and KEGs proportional to the numbers of their UIKs and eligible voters. The third measure – the share of UIKs with electronic vote count in TIKs where electronic vote count is present (column 5) – is much more variable. It varies from 0.05 in six regions to 1 in Kostroma Oblast, has the mean of 0.28 and the standard deviation of 0.21. Furthermore, it tends to be somewhat smaller as Putin's overall share of the vote increases ($R^2 = 0.186$). It means that TIKs in the most susceptible to fraud regions include very few UIKs with electronic vote count (6% in Bashkortostan, 7% in Ingushetia, 9% in Dagestan, 11% in Tatarstan, etc.), and that these UIKs, therefore, can be easily allocated in those places where the level of incumbent's support is higher or electoral fraud can be more manageable.

Appendix C2. Last-digit frequencies of Putin's vote count and vote share in Russia's regions from the 2012 presidential election

Table C2. Last-digit frequencies of Putin's vote count in Russia's regions from the 2012 presidential election compared with Benford's law

Region	Last Digit 0	1	2	3	4	5	6	7	8	9	SD, %	χ^2_{LBL}
Altai K.	192	183	176	198	203	180	173	185	183	189	.51	4.3
Amur O.	82	68	84	89	82	56	75	75	82	90	1.31	12.1
Arkhangelsk O.	102	102	103	95	99	89	89	117	95	93	.85	6.3
Astrakhan O.	62	61	67	54	63	46	65	49	65	54	1.25	8.2
Belgorod O.	142	137	115	109	105	122	122	128	136	134	1.00	11.3
Bryansk O.	116	125	119	109	108	110	98	108	117	114	.66	4.5
Vladimir O.	94	91	81	85	96	107	91	82	113	100	1.11	1.4
Volgograd O.	154	177	147	173	158	178	167	161	165	173	.62	5.8
Vologda O.	108	89	125	108	106	99	101	111	92	101	.98	9.0
Voronezh O.	195	155	199	164	156	156	162	156	162	175	.98	14.5
Moscow	334	348	323	353	329	343	351	308	349	348	.44	5.8
Saint Petersburg	187	167	231	177	213	194	209	176	192	191	1.00	17.3*
Jewish A.Ob.	12	17	21	11	10	16	5	21	16	15	3.47	15.6
Zabaykalsky K.	104	81	103	98	115	94	77	97	99	87	1.19	12.1
Ivanovo O.	74	80	62	65	84	71	67	72	84	58	1.25	1.1
Irkutsk O.	190	189	183	213	205	196	195	173	193	188	.58	5.7
Kabardino-Balkar R.	42	37	35	37	47	38	33	27	24	36	1.86	11.1
Kaliningrad O.	47	61	56	52	53	75	60	46	46	55	1.60	12.7
Kaluga O.	72	74	75	58	79	77	83	69	69	67	.97	6.2
Kamchatka K.	27	41	35	32	35	33	30	25	34	31	1.39	5.6
Karachay-Cherkess R.	23	18	27	25	30	25	27	19	25	27	1.51	5.1
Kemerovo O.	184	160	195	175	178	198	148	150	148	182	1.11	19.1*
Kirov O.	136	119	124	119	111	119	134	119	120	110	.70	5.3
Kostroma O.	58	65	52	63	66	72	58	70	57	62	1.00	5.6
Krasnodar K.	267	284	284	268	269	262	275	283	253	268	.38	3.5
Krasnoyarsk K.	201	211	231	196	225	211	231	218	221	229	.57	6.4
Kurgan O.	126	117	119	113	122	118	113	101	124	122	.62	4.0
Kursk O.	130	110	95	120	115	119	115	121	109	119	.81	6.7
Leningrad O.	112	97	96	90	87	114	107	92	96	98	.93	7.6
Lipetsk O.	91	101	83	87	81	93	82	76	81	100	.97	7.4
Magadan O.	5	14	12	11	15	5	14	8	11	8	3.55	11.7
Moscow O.	324	350	346	322	334	318	319	350	374	351	.54	9.0
Murmansk O.	64	53	61	67	57	69	59	75	62	55	1.09	6.6
Nenets A.O.	3	4	4	7	2	9	5	4	5	8	4.38	8.8
Nizhny Novgorod O.	235	232	230	217	227	267	229	241	220	233	.59	7.3
Novgorod O.	66	55	57	52	49	42	51	66	61	46	1.49	1.8
Novosibirsk O.	224	201	200	211	205	208	205	171	198	209	.66	8.0
Omsk O.	192	183	161	173	185	167	199	189	199	199	.74	9.2
Orenburg O.	173	181	189	161	191	177	156	196	210	178	.89	12.9
Oryol O.	85	57	82	75	87	71	67	69	80	76	1.23	1.1
Penza O.	129	118	104	115	117	142	110	106	102	106	1.09	12.3
Perm K.	176	199	176	184	189	190	198	206	181	191	.53	4.8
Primorsky K.	162	172	170	138	159	161	162	144	151	168	.70	7.1
Pskov O.	66	61	57	68	65	61	66	68	75	61	.78	3.6
Adygea R.	26	30	24	28	36	23	35	16	20	26	2.36	13.2
Altai R.	16	21	34	24	21	20	21	30	26	29	2.27	11.2
Bashkortostan R.	302	339	369	356	347	356	339	367	366	368	.59	11.0
Buryatia R.	87	94	70	77	80	78	88	81	83	98	1.00	7.5
Dagestan R.	237	190	180	172	189	219	172	176	190	174	1.14	22.4**
Ingushetia R.	17	16	14	21	12	10	8	8	11	13	3.18	11.8
Kalmykia R.	37	27	28	17	33	21	24	21	27	18	2.53	14.6
Karelia R.	59	72	64	43	72	43	43	45	53	49	2.16	22.9**
Komi R.	63	66	63	62	90	68	62	68	54	64	1.41	11.8
Mari El R.	68	67	51	52	47	57	67	42	51	50	1.66	13.8
Mordovia R.	63	84	84	81	75	66	84	93	83	89	1.19	1.2
Sakha (Yakutia) R.	69	92	86	75	92	69	70	78	93	89	1.25	11.4
North Ossetia-Alania R.	46	40	51	32	31	24	34	41	38	34	2.11	14.8
Tatarstan R.	289	291	293	282	296	291	288	287	282	254	.42	4.4
Tuva R.	14	16	21	18	24	22	14	20	20	14	2.00	6.6
Khakassia R.	47	48	37	38	28	45	37	38	35	42	1.54	8.5

Rostov O.	290	256	235	245	263	276	274	256	258	241	.66	1.0
Ryazan O.	119	109	107	98	109	98	115	93	104	111	.76	5.6
Samara O.	170	157	167	196	186	160	183	142	187	162	.98	14.7
Saratov O.	191	177	157	162	172	191	217	165	171	180	.99	15.8
Sakhalin O.	54	37	40	43	40	48	51	53	39	40	1.43	8.2
Sverdlovsk O.	264	235	263	276	251	241	246	258	246	257	.48	5.3
Smolensk O.	71	88	83	85	62	86	82	90	84	79	1.05	8.0
Stavropol K.	130	135	117	122	143	143	131	115	120	109	.93	9.8
Tambov O.	101	116	102	95	86	87	87	89	92	97	.98	8.2
Tver O.	120	130	108	139	146	153	114	123	113	113	1.23	17.2*
Tomsk O.	91	76	85	87	68	70	65	82	69	84	1.19	9.9
Tuva R.	113	113	101	106	107	119	119	120	111	126	.67	4.6
Tyumen O.	106	130	102	109	95	122	106	125	118	115	.98	9.8
Udmurt R.	134	117	125	126	97	114	123	123	111	115	.86	7.9
Ulyanovsk O.	83	80	91	102	109	121	103	109	105	90	1.30	15.2
Khabarovsk K.	82	92	77	70	88	89	84	77	83	91	.85	5.4
Khanty–Mansi A.O.	77	73	65	62	55	58	66	66	70	65	1.00	5.9
Chelyabinsk O.	216	255	229	232	244	221	201	236	209	202	.80	12.9
Chechen R.	41	44	41	56	42	40	43	52	41	54	1.35	7.4
Chuvash R.	114	124	124	98	137	111	110	120	111	127	.94	9.3
Chukotka A.O.	6	8	7	5	7	6	5	2	8	3	3.51	6.3
Yamalo-Nenets A.O.	19	21	15	20	25	23	20	19	27	22	1.60	4.9
Yaroslavl O.	74	99	90	85	100	91	95	78	99	95	1.00	8.1
Median	101	97	95	95	96	94	91	93	96	98	1.0	8.8
Mean	117	116	114	112	116	115	113	112	114	114	1.23	9.5
Total	9713	9652	9535	9378	9655	9627	9455	9369	9528	9548	.12	13.2

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. SD denotes the standard deviation of probabilities (frequencies are converted into probabilities for this statistic) expressed in percentages (i.e., multiplied by 100). χ^2_{LBL} denotes chi-squared statistic for the last digit, where all digits' expected probability, according to Benford's law, is equal to 0.1. Due to space limits, mean statistics for digits are rounded and shown without fractional parts. Significance levels: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$. Significant at : *$p < 0.05$, **$p < 0.01$.

Table C2 confirms the irrelevance of Benford's law for detecting fraud in vote counts. Not only chi-squared statistic is insignificant at total but also few statistics appeared to be significant at the regional level. Surprisingly, we do not find significant values of chi-squared even in those regions where elections are evidently rigged: in Chechnya (χ^2 = 7.4), Tatarstan (χ^2 = 4.4), and Bashkiria (χ^2 = 11.0). Among the highly suspected of fraud regions, only the Dagestan's statistic is significant at 1-percnt level (χ^2 = 22.4), yet the statistic for Karelia is of the same level of significance (χ^2 = 22.9) though the level of fraud in this region is moderate. Among the other three regions, where significant irregularities were detected, the amount of fraud is moderate in Saint Petersburg (χ^2 = 17.3) and Kemerovo Oblast (χ^2 = 19.1) and rather small in Tver Oblast (χ^2 = 17.2).[175]

Similarly to Table 3.2, the size of last-digit deviations, as indicated by the median, is much larger at the regional level (1.0) than at total (0.12). The chi-squared statistics do not show such discrepancy; it is even smaller at the regional level (8.8) than at total (13.2). Hence, larger last-digit deviations at the subnational level occur also under conditions of electoral fraud. Our two measures of this discrepancy applied to vote counts, however, do not allow to conclude that the difference is larger in the exposed to fraud election data.

[175] See Chapter 5 for measurement of electoral fraud.

Table C3. Last-digit frequencies of Putin's vote share in Russia's regions from the 2012 presidential election compared with Benford's law

Region	Last Digit										SD, %	$\chi^2_{LBL\%}$
	0	1	2	3	4	5	6	7	8	9		
Altai K.	190	212	185	199	195	194	154	188	167	178	.89	13.2
Amur O.	87	72	58	87	68	67	78	92	90	84	1.47	15.3
Arkhangelsk O.	113	91	88	104	92	110	102	98	99	87	.91	7.4
Astrakhan O.	66	53	69	47	60	49	56	62	55	69	1.35	9.6
Belgorod O.	141	137	117	125	131	121	116	127	124	111	.75	6.4
Bryansk O.	109	110	120	112	111	127	102	109	105	119	.67	4.5
Vladimir O.	106	105	96	86	89	86	79	70	106	117	1.54	2.2
Volgograd O.	190	172	161	146	155	166	190	175	149	149	.99	14.4
Vologda O.	112	112	102	92	100	86	97	122	117	99	1.10	11.4
Voronezh O.	158	175	191	163	174	171	172	168	157	151	.68	7.0
Moscow	367	353	***303***	333	310	299	316	339	362	**403**	.98	29.3**
Saint Petersburg	239	198	220	202	204	190	161	174	173	176	1.23	26.6*
Jewish A.Ob.	12	13	13	16	11	16	16	18	16	13	1.58	3.2
Zabaykalsky K.	92	79	91	103	101	97	97	81	100	114	1.09	1.1
Ivanovo O.	69	69	74	79	64	76	70	66	81	69	.78	3.9
Irkutsk O.	189	197	177	156	190	215	198	194	220	189	.94	15.2
Kabardino-Balkar R.	25	***14***	***16***	***13***	25	37	39	38	**98**	51	7.09	161.1***
Kaliningrad O.	59	51	50	61	55	58	65	40	56	56	1.25	7.8
Kaluga O.	67	59	63	85	73	64	85	77	75	75	1.24	1.0
Kamchatka K.	36	31	27	28	23	23	40	40	38	37	2.08	12.6
Karachay-Cherkess R.	22	17	15	20	31	29	31	24	28	29	2.39	12.6
Kemerovo O.	178	202	186	158	168	174	153	195	141	163	1.11	19.1
Kirov O.	112	99	118	123	115	134	138	131	109	132	1.04	11.9
Kostroma O.	72	68	67	64	52	56	64	59	49	72	1.29	9.3
Krasnodar K.	255	314	282	256	221	298	302	268	237	280	1.09	29.1**
Krasnoyarsk K.	225	222	246	203	214	209	210	204	214	227	.60	7.0
Kurgan O.	123	123	107	114	117	121	121	113	114	122	.46	2.2
Kursk O.	113	104	106	116	116	112	119	127	129	111	.70	5.1
Leningrad O.	108	106	97	104	110	95	96	95	93	85	.79	5.6
Lipetsk O.	76	87	86	84	97	108	105	89	80	63	1.53	18.5
Magadan O.	9	15	15	10	10	6	11	9	10	8	2.75	7.0
Moscow O.	353	329	334	355	347	349	328	345	306	342	.44	5.9
Murmansk O.	64	77	40	57	56	65	50	69	63	81	1.96	21.5
Nenets A.O.	0	6	4	6	6	9	5	6	6	3	4.66	1.0
Nizhny Novgorod O.	239	223	263	221	224	268	231	210	242	210	.86	15.6
Novgorod O.	51	52	69	49	67	61	58	44	38	56	1.79	15.7
Novosibirsk O.	185	213	198	219	244	206	204	183	205	175	.98	17.6
Omsk O.	207	190	180	194	169	164	175	179	189	200	.74	9.1
Orenburg O.	192	185	183	183	180	160	171	181	192	185	.53	4.5
Oryol O.	69	59	88	77	98	64	77	71	73	73	1.50	15.3
Penza O.	115	122	111	116	114	122	99	131	104	115	.79	6.5
Perm K.	177	185	179	178	156	177	208	225	202	203	1.06	19.2
Primorsky K.	197	148	180	159	159	157	151	152	146	138	1.10	17.2
Pskov O.	52	72	63	57	66	68	79	72	63	56	1.29	9.7
Adygea R.	28	33	26	20	30	27	24	20	23	33	1.80	7.7
Altai R.	17	24	28	32	23	20	32	24	20	22	2.09	9.5
Bashkortostan R.	330	339	393	348	330	**479**	**405**	350	281	***254***	1.81	103.8***
Buryatia R.	75	84	91	88	86	84	74	84	86	84	.63	3.0
Dagestan R.	**275**	***99***	111	119	155	**250**	**275**	**256**	196	163	3.68	231.5***
Ingushetia R.	7	20	**32**	**45**	8	7	4	4	***2***	***1***	11.35	150.6***
Kalmykia R.	32	23	30	23	27	28	23	27	19	21	1.64	6.1
Karelia R.	73	47	56	54	63	54	44	56	51	45	1.61	12.7
Komi R.	67	60	62	73	71	65	64	58	73	67	.79	3.7
Mari El R.	64	55	64	56	50	47	48	62	60	46	1.29	8.3
Mordovia R.	***50***	***52***	***42***	55	75	108	105	**109**	**119**	87	3.62	94.7***
Sakha (Yakutia) R.	85	77	93	75	91	80	81	76	85	70	.89	5.8
North Ossetia-Alania R.	**99**	26	28	28	32	30	29	27	23	**49**	6.16	126.8***
Tatarstan R.	216	***162***	***157***	182	185	313	299	**364**	**525**	**450**	4.51	522.0***
Tuva R.	21	***9***	***8***	13	16	18	**28**	24	22	24	3.67	22.2*
Khakassia R.	39	38	32	49	43	38	33	39	42	42	1.25	5.5
Rostov O.	275	273	273	258	277	275	263	233	237	230	.73	12.5
Ryazan O.	91	111	121	116	118	97	87	95	115	112	1.17	13.2
Samara O.	153	166	175	170	164	179	179	201	171	152	.83	1.5
Saratov O.	187	185	174	187	176	202	194	174	136	168	1.01	16.5
Sakhalin O.	**69**	48	36	37	43	46	35	37	50	44	2.28	20.7
Sverdlovsk O.	248	267	259	247	233	232	266	248	283	254	.62	8.8
Smolensk O.	90	68	64	90	98	78	75	72	99	76	1.53	17.1

Stavropol K.	133	138	120	137	130	107	124	135	124	117	.79	7.1
Tambov O.	111	92	99	90	85	108	82	107	82	96	1.14	11.1
Tver O.	122	138	127	142	119	113	125	112	135	126	.80	7.3
Tomsk O.	74	94	80	86	66	72	81	89	67	68	1.27	11.2
Tuva R.	108	116	113	100	100	110	139	114	116	119	.97	9.7
Tyumen O.	111	134	125	132	113	131	114	87	83	98	1.64	27.3*
Udmurt R.	142	132	115	115	111	112	104	98	133	123	1.17	14.5
Ulyanovsk O.	110	96	110	102	114	101	107	80	88	85	1.18	12.4
Khabarovsk K.	85	83	93	84	89	77	80	85	78	79	.61	2.8
Khanty–Mansi A.O.	***44***	54	67	84	79	**101**	67	56	67	***38***	2.88	49.2***
Chelyabinsk O.	220	246	249	208	238	219	216	211	247	191	.87	15.4
Chechen R.	**437**	0	0	0	0	0	0	0	3	14	30.32	3757***
Chuvash R.	131	91	109	97	126	130	141	125	132	94	1.55	25.3*
Chukotka A.O.	10	4	3	2	5	3	12	4	11	3	6.62	22.5*
Yamalo-Nenets A.O.	***11***	14	14	24	**30**	**39**	21	20	18	20	3.94	29.5**
Yaroslavl O.	89	110	86	100	102	99	81	81	75	83	1.26	13.0
Median	108	94	96	97	100	101	97	92	99	87	1.17	12.5
Mean	122	112	112	111	112	117	115	115	116	112	2.07	73.7
Total	10181	9365	9346	9274	9307	9788	9630	9550	9643	9374	.29	74.6***

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. Vote share is measured in percentage points and pounded (for example, Putin V_i^I/V_i = 616/1010 = 0.6099009901 -> 61%). The most numerous last-digit frequencies are shown in bold, bold italics marks the scantiest frequencies. SD denotes the standard deviation of probabilities (frequencies are converted into probabilities for this statistic) expressed in percentages (i.e., multiplied by 100). χ^2_{LBL} denotes chi-squared statistic for the last digit, where all digits' expected probability, according to Benford's law, is equal to 0.1. Due to space limits, mean statistics for digits are rounded and shown without fractional parts. Significance levels: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$. Significant at: *$p < 0.01$, **$p < 0.001$, ***$p < 0.0001$.

In contrast with the distributions of vote counts, in Table C3, we find support for the applicability of Benford's law for detecting fraud in percentage points of the vote. Out of 83 regions, chi-squared statistics are significant at 0.01 and higher levels in 17 regions and 26 observations are significant at $p < 0.05$. All major paradigmatic cases of expected fraud are marked by significant χ^2 values. No cases of fraud are detected misleadingly. A moderate level of fraud is unexpectedly detected only in Moscow where nines are observed too frequently and twos are observed too seldom. The most deviating case is Chechnya (χ^2 = 3757). Zeroes prevail in the distribution of the last digit, numbers from 1 to 7 are not observed at all, and few numbers of 8 and 9 occur. This happens, however, for the reason that the average Putin's vote share in the region is equal to 99.9%. This vote share is rounded to 100 for the analysis. Even if the vote share had been equal to 96–99%, the probability of numbers 6–9 would have been higher since the vote share is limited on the right at 100%. Such limit is absent if the vote share equals, for example, 88% and given that the vote share in a fair electoral contest tend to be normally-distributed, the last-digit distribution should theoretically not have an intrinsic bias. Put otherwise, the validity of last-digit tests applied to percentages of the vote is questionable in cases where the candidate's vote share in the region exceeds 90%.

Putin's vote share in Kabardino-Balkar Republic (KBR) is equal to 77.7%. At this level, digit tests should work properly. The last-digit distribution in KBR is characterized by low frequencies of numbers 1, 2, and 3 (2.4 times smaller than it should be according to the LBL) and by excessively frequent number 8 (2.9 times > the LBL). Furthermore, 85 out of 98 eights belong to the vote share (78%) that is exactly equal to the region's average. In this regard, KBR's data contain a record number of falsifications "in a line" (see Chapter 2). Nevertheless, this type of fraud occurs relatively rarely. The average Putin's vote share in Mordovia equals 87.6%. Here we may again see that eights occur 1.5 times more frequently than the LBL prescribes. But exactly equal to the region's average vote shares (88%) occur only in 7 precincts; the vast majority of eights belongs to 98% (frequency = 96). A similar situation is with adjacent nines (1.4 times > the LBL): only 15 of them belong to 89% but 52 belong to 99%. This difference, in particular, indicates that types of fraud vary by region.

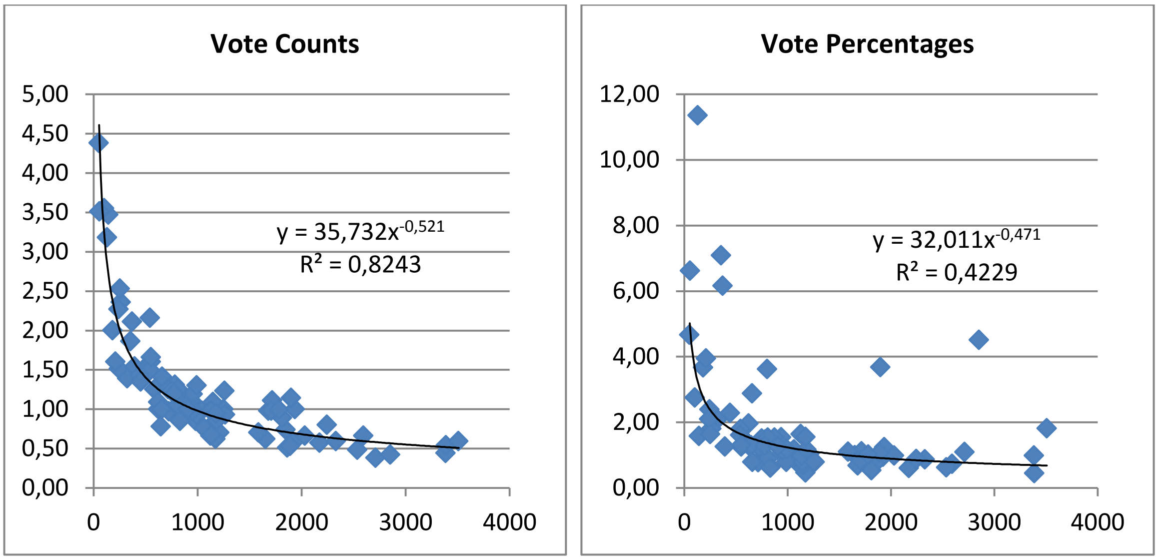
On the one hand, looking at the most numerous and the scantiest last-digit frequencies in the regions where most serious irregularities were detected (indicated by bold font), we can see several digit biases: 1) a bias toward zeroes (Dagestan (together with nines), North Ossetia (together with nines), Sakhalin, and Chechnya), 2) a bias toward fives (Bashkiria, Dagestan, and Khanty–Mansi A.O.), 3) a bias toward nines (Moscow, North Ossetia, and Tatarstan), and a bias toward numbers between 5 and 9 (KBR, Mordovia, and Tuva). These biases are sometimes mutually exclusive. A bias toward fives in Bashkiria leads to a lower frequency of nines. In Yamalo-Nenets A.O., it lowers the frequency on zeroes. In Khanty–Mansi A.O., a bias toward fives lowers both frequencies of zeroes and nines. A bias toward eights lowers the frequency of zeroes in Mordovia.

On the other hand, in the result of aggregation, this variety of biases produces a general pattern in which smaller numbers (1, 2, and 3) are scarce and zeroes, fives, and eights are excessive. To what extent are effects of these biases muted in the result of aggregation? We can try to answer this question by comparing region-specific and total indicators from Table C2 where no fraud is detected and Table C3 where a considerable amount of fraud is detected, while both represent the same election and only the level of fraud rather than other characteristics should theoretically influence the cross-regional variability. Presumably, if the average standard deviation of the last-digit probabilities *relatively* to the country-total standard deviation is larger in the case of fraud than in the case where no fraud is detected, then the larger variance of probabilities at the regional level is muted when the data are pooled. The ratio of median to total SD (8.3) is close to the ratio of mean to total SD (10.3) in Table C2. Where electoral fraud is detected by the LBL (Table C3), the distribution of regional SD of last-digit probabilities is more skewed due to the cases of extreme fraud (Chechya, Tatarstan etc.), therefore to the ratio of mean to total SD (7.1) is considerably larger than the ratio of median to total SD (4.0). However, the both ratios are rather smaller than the ratios from the table with vote counts. Hence, at least from this comparison, we cannot conclude that the existing region-level biases are muted in the result of aggregation.

It should be also pointed out that the digit biases observed in Table C3 are substantively different from those revealed in the literature. The experimental results suggest that subjects prefer small numbers (1, 2, and 3) over larger numbers (5 – 9) and zero when they are asked to produce random numbers (Beber and Scacco 2012: 218–220). By contrast, the last-digit frequencies indicate that perpetrators of fraud largely prefer zeroes, fives, and larger numbers, whereas small numbers (1, 2, and 3) are neglected.

Figure C1 confirms a finding from the main text in Chapter 3 that the scope of variance of the last digit probabilities is larger when the number of observations is smaller and displays that this relationship is exponential for both vote counts and vote percentages. This fact, additionally to similar results of Table 3.2, puts validity of measures designed to gauge the share of falsified polling stations based on the deviation of observed digit probabilities from Benford's law (such as Medzihorsky 2015) into question, especially at the regional level, so long as these measures do not take the dependence of the last-digit SD on the number of cases into account.

Figure C1. The dependence of the region-level standard deviations of last-digit probabilities on the number of observations



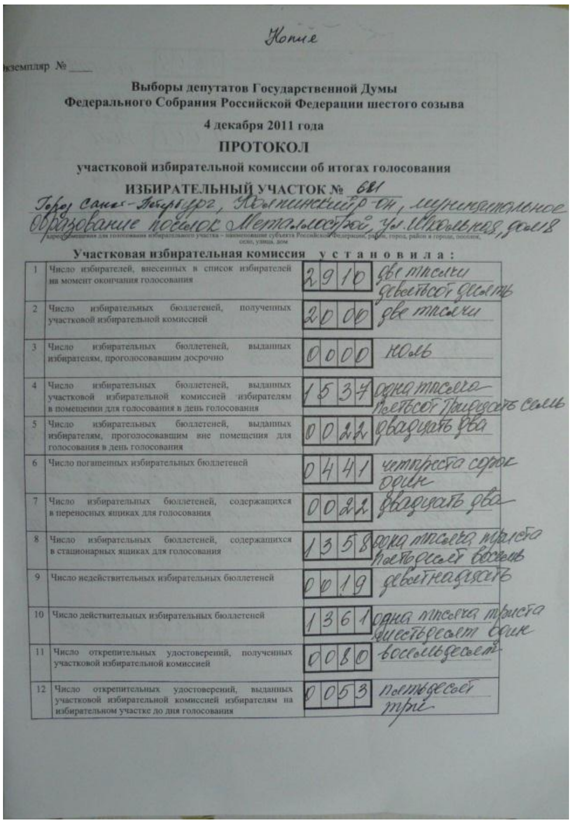
Note: The data come from Table C2 and C3, respectively. Chechnya as an outlier is excluded from the plot on the right.

Appendix C3. Falsification of a polling station protocol: The last digit remains unamended

Figures C2 and C3 display a photocopy of electoral commission's protocol of polling station (UIK) No. 681 (located at Saint Petersburg, territorial electoral commission (TIK) No. 21) from the Russian 2011 parliamentary election . The copy is made by the author in the role of electoral observer at the polling station.[176] In combination with Figure C4, which shows the official election results for the set of UIKs in TIK No. 21, Figures C2 and C3 clearly indicate that fictitious numbers were reported by the Central Electoral Commission in such a manner that the number of eligible voters, the number of valid ballots, and other common fields (first 18 cells in the table) remained the same as in the polling station protocol but only the results of political parties were changed. Furthermore, the results were changed so that only the first or first two digits in the vote counts deviate from the protocol but the last digit is left unamended.

176 For the full process of observation, see the video entitled "The Total Falsification of Elections in Saint Petersburg on 04.12.2011 [*Totalnaya Falsifikatsiya Vyborov v Peterburge 04.12.2011*]". Available at: https://www.youtube.com/watch?v=0DPKN3tDOZ4

Figure C2. The copy of protocol of UIK No. 681 (Saint Petersburg, TIK No. 21) from the Russian 2011 parliamentary election, the front page



Копия

Экземпляр № ____

Выборы депутатов Государственной Думы
Федерального Собрания Российской Федерации шестого созыва

4 декабря 2011 года

ПРОТОКОЛ

участковой избирательной комиссии об итогах голосования

ИЗБИРАТЕЛЬНЫЙ УЧАСТОК № 681

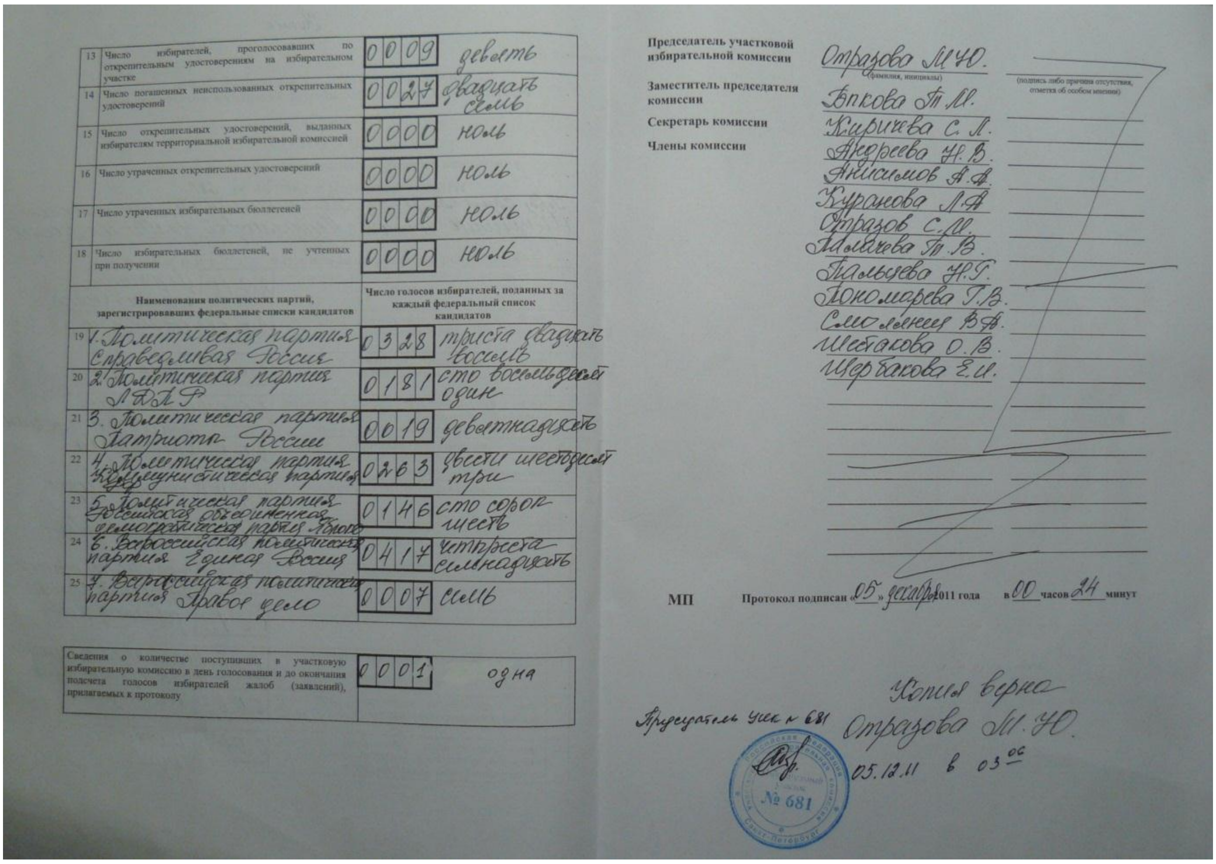
Город Санкт-Петербург, Колпинский р-он, муниципальное образование поселок Металлострой, ул. Школьная, дом 18

(адрес помещения для голосования избирательного участка – наименование субъекта Российской Федерации, район, город, район в городе, поселок, село, улица, дом)

Участковая избирательная комиссия установила:

1	Число избирателей, внесенных в список избирателей на момент окончания голосования	2910	две тысячи девятьсот десять
2	Число избирательных бюллетеней, полученных участковой избирательной комиссией	2000	две тысячи
3	Число избирательных бюллетеней, выданных избирателям, проголосовавшим досрочно	0000	ноль
4	Число избирательных бюллетеней, выданных участковой избирательной комиссией избирателям в помещении для голосования в день голосования	1537	одна тысяча пятьсот тридцать семь
5	Число избирательных бюллетеней, выданных избирателям, проголосовавшим вне помещения для голосования в день голосования	0022	двадцать два
6	Число погашенных избирательных бюллетеней	0441	четыреста сорок один
7	Число избирательных бюллетеней, содержащихся в переносных ящиках для голосования	0022	двадцать два
8	Число избирательных бюллетеней, содержащихся в стационарных ящиках для голосования	1358	одна тысяча триста пятьдесят восемь
9	Число недействительных избирательных бюллетеней	0019	девятнадцать
10	Число действительных избирательных бюллетеней	1361	одна тысяча триста шестьдесят один
11	Число открепительных удостоверений, полученных участковой избирательной комиссией	0080	восемьдесят
12	Число открепительных удостоверений, выданных участковой избирательной комиссией избирателям на избирательном участке до дня голосования	0053	пятьдесят три

Figure C3. The copy of protocol of UIK No. 681 (Saint Petersburg, TIK No. 21) from the Russian 2011 parliamentary election, pages 2–3



13	Число избирателей, проголосовавших по открепительным удостоверениям на избирательном участке	0009	девять
14	Число погашенных неиспользованных открепительных удостоверений	0027	двадцать семь
15	Число открепительных удостоверений, выданных избирателям территориальной избирательной комиссией	0000	ноль
16	Число утраченных открепительных удостоверений	0000	ноль
17	Число утраченных избирательных бюллетеней	0000	ноль
18	Число избирательных бюллетеней, не учтенных при получении	0000	ноль
	Наименования политических партий, зарегистрировавших федеральные списки кандидатов	**Число голосов избирателей, поданных за каждый федеральный список кандидатов**	
19	1. Политическая партия Справедливая Россия	0328	триста двадцать восемь
20	2. Политическая партия ЛДПР	0181	сто восемьдесят один
21	3. Политическая партия Патриоты России	0019	девятнадцать
22	4. Политическая партия Коммунистическая партия КПРФ	0263	двести шестьдесят три
23	5. Политическая партия Российская объединенная демократическая партия Яблоко	0146	сто сорок шесть
24	6. Всероссийская политическая партия Единая Россия	0417	четыреста семнадцать
25	7. Всероссийская политическая партия Правое дело	0007	семь

Сведения о количестве поступивших в участковую избирательную комиссию в день голосования и до окончания подсчета голосов избирателей жалоб (заявлений), прилагаемых к протоколу	0001	одна

Председатель участковой избирательной комиссии — Отразова М.Ю. (фамилия, инициалы) (подпись либо причина отсутствия, отметка об особом мнении)

Заместитель председателя комиссии — Быкова Т.М.

Секретарь комиссии — Киричева С.Л.

Члены комиссии — Андреева Н.В., Анисимов А.А., Куранова Л.А., Отразов С.М., Малычева Т.В., Пальцева Н.Г., Пономарева Г.В., Смоленцев В.А., Шестакова О.В., Щербакова Е.И.

МП Протокол подписан «05» декабря 2011 года в 00 часов 24 минут

Копия верна
Председатель УИК № 681 Отразова М.Ю.
05.12.11 в 03[00]

№ 681

Figure C4. Election results from the Russian 2011 parliamentary election reported by the electoral commission, including UIK No. 681 (Saint Petersburg, TIK No. 21)

www.vybory.izbirkom.ru/region/izbirkom?action=show&global=true&root=782000028&tvd=2782000259702&vrn=100100028713299&prver=0&pronetvd=null&region=78

ИК №668	УИК №669	УИК №670	УИК №671	УИК №672	УИК №673	УИК №674	УИК №675	УИК №676	УИК №677	УИК №678	УИК №679	УИК №680	УИК №681	УИК №682	УИК №683
2284	2144	2485	2205	383	1166	1938	2034	1474	1546	986	1989	2654	2910	2573	2072
2000	1500	2000	2000	400	1000	1500	1500	1500	1500	1000	1500	2000	2000	2000	1500
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
891	917	1076	1281	0	661	1109	1331	1011	666	664	1290	1359	1537	1088	1053
21	23	14	15	336	19	37	18	9	37	19	35	23	22	21	46
1088	560	910	704	64	320	354	151	480	797	317	175	618	441	891	401
21	23	14	15	335	19	37	18	9	37	19	29	23	22	21	46
888	917	1076	1281	0	661	1082	1313	870	666	663	1148	1359	1358	1082	1053
18	10	13	14	5	18	14	38	28	18	20	0	23	19	17	14
891	930	1077	1282	330	662	1105	1293	851	685	662	1177	1359	1361	1086	1085
50	50	50	50	0	50	50	50	50	50	50	50	80	80	80	50
12	5	19	23	0	8	10	20	16	17	8	50	55	53	20	18
3	7	6	8	3	11	5	13	10	11	11	8	9	9	12	9
38	45	31	27	0	42	40	30	34	33	42	0	25	27	60	32
0	0	0	22	0	0	14	22	4	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70 7.70%	86 9.15%	108 9.91%	345 26.62%	117 34.93%	23 3.38%	104 9.29%	156 11.72%	155 17.63%	22 3.13%	23 3.37%	256 21.75%	74 5.35%	118 8.55%	88 7.98%	246 22.38%
165 18.15%	115 12.23%	164 15.05%	112 8.64%	33 9.85%	72 10.59%	73 6.52%	201 15.10%	6 0.68%	81 11.52%	52 7.62%	139 11.81%	176 12.74%	211 15.29%	107 9.70%	115 10.46%
17 1.87%	7 0.74%	16 1.47%	7 0.54%	5 1.49%	12 1.76%	24 2.14%	12 0.90%	6 0.68%	0 0.00%	12 1.76%	7 0.59%	16 1.16%	19 1.38%	14 1.27%	9 0.82%
38 4.18%	131 13.94%	149 13.67%	143 11.03%	51 15.22%	132 19.41%	158 14.12%	162 12.17%	99 11.26%	148 21.05%	62 9.09%	206 17.50%	98 7.09%	63 4.57%	114 10.34%	157 14.29%
28 3.08%	51 5.43%	9 0.83%	45 3.47%	14 4.18%	31 4.56%	58 5.18%	48 3.61%	53 6.03%	39 5.55%	31 4.55%	67 5.69%	25 1.81%	26 1.88%	28 2.54%	66 6.01%
563 61.94%	535 56.91%	623 57.16%	622 47.99%	107 31.94%	377 55.44%	684 61.13%	706 53.04%	526 59.84%	395 56.19%	467 68.48%	492 41.80%	951 68.81%	917 66.45%	731 66.27%	485 44.13%
10 1.10%	5 0.53%	8 0.73%	8 0.62%	3 0.90%	15 2.21%	4 0.36%	8 0.60%	6 0.68%	0 0.00%	15 2.20%	10 0.85%	19 1.37%	7 0.51%	4 0.36%	7 0.64%

Note: The table is a webpage screenshot of the Saint Petersburg Electoral Commission. Available at at: http://www.vybory.izbirkom.ru/region/izbirkom?action=show&global=true&root=782000028&tvd=2782000259702&vrn=100100028713299&prver=0&pronetvd=null&region=78&sub_region=78&type=233&vibid=2782000259702 (site visit: 10 January 2018).

Nearly all "stolen" votes were expectedly redistributed in favor of United Russia; only the mostly affiliated with the incumbent LDPR received a "bonus" of 30 votes. Judging from the absolute number of votes, Just Russia has suffered the most – it was deprived of 210 of its votes, thereby its vote share decreased from 24.1% to 8.6%. The second challenger – KPRF – lost exactly 200 votes and its vote share decreased from 19.3% to 4.6%. A liberal-democratic party Yabloko, which is relatively popular in Saint Petersburg, lost the most in relative terms – 120 (82.2%) of its 146 votes, ant its vote share decreased from 10.7% to an insignificant 1.9%. Few votes of two small "spoiler parties" – the Patriots of Russia and the Right Cause – appeared to be unchanged. In the result, United Russia gained 500 additional votes to the initial 417 (i.e., received 2.2 times more votes than it possessed); its vote share increased from 30.6% to 66.5%. Notwithstanding these huge changes, the last digit in the vote counts is unamended. This example shows how the numbers can be easily manipulated to make last-digit Benford's law irrelevant for detecting fraud in electoral data.

Table C4. Last-digit frequencies and probabilities of the difference between the official vote counts and the vote counts indicated in copies of polling station protocols from the Russian 2011 parliamentary election

	United Russia		Just Russia		KPRF		Yabloko		Total	
Last Digit	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
0	208	31.9	202	54.6	118	38.2	137	40.1	665	39.7
1	62	9.5	25	6.8	27	8.7	27	7.9	141	8.4
2	48	7.4	17	4.6	20	6.5	30	8.8	115	6.9
3	41	6.3	22	5.9	23	7.4	25	7.3	111	6.6
4	60	9.2	19	5.1	18	5.8	19	5.6	116	6.9
5	60	9.2	27	7.3	29	9.4	30	8.8	146	8.7
6	38	5.8	13	3.5	16	5.2	23	6.7	90	5.4
7	52	8.0	12	3.2	16	5.2	14	4.1	94	5.6
8	46	7.0	19	5.1	21	6.8	22	6.4	108	6.5
9	38	5.8	14	3.8	21	6.8	15	4.4	88	5.3
Total	653	100	370	100	309	100	342	100	1674	100

Note: Data source: RuElect (2011).

As follows from last-digit frequencies of the difference between the official United Russia's vote count and its vote count from polling station protocols collected by observers (RuElect 2011), this type of electoral forgery is widespread. Out of 653 cases in which the difference between the official data and the data of protocols exceeds zero,[177] in 64 cases this difference is equal to a factor of 100 (100, 200, 300...). Put otherwise, in nearly ten percent of cases, fraudsters do not bother themselves with complicated calculations; they simply add exactly one or several hundreds of votes to United Russia. They also tend to add quantities of votes that are factors of ten. In 208 (31.9%) cases, the last digit of the difference between the official United Russia's vote and its result verified by electoral observers turns out to be zero (see Table C4). The proportion of zeroes in the last digit of the number of votes "stolen" from the opposition parties is even larger. It reaches 54.6% in Just Russia's fictitiously subtracted votes and equals to 38.2% and 40.1% for KPRF and Yabloko, respectively. In 163 cases, vote counts were falsified so that United Russia received an additional number of votes that can be divided by 10 without producing a fraction and at the same time each of major opposition parties (Just Russia, KPRF, and Yabloko) either lost a number of votes that can be also evenly divided by 10 or its vote counts were unamended. Thus, nearly in one third of cases (in 31.9% regarding only United Russia's votes and in 25.0% if opposition's votes are simultaneously taken into account), fraudsters changed only the first, first two or first three significant digits in vote counts but left the last digit unamended by adding (to United Russia) or subtracting (from opposition's vote counts) numbers that are factors of ten. These findings are, however, relevant only to those polling stations for which copies of polling station protocols are available (N = 1022). The

[177] In no case the difference is negative. It equals zero in 369 (36.1%) cases. Hence, United Russia's election results were changed in its favor after the vote count in 63.9% of cases.

pattern of fraud is more likely to be different in non-monitored polling stations where electoral manipulations are more centralized and members of electoral commissions are compelled to produce a claimed share of the vote.

Table C4 also indicates that the second fraudster preference in adding or subtracting fictitious vote counts regarding the last digit is number five. In other words, fraudsters add (or subtract) fives to the last digit of genuine vote counts. Nevertheless, since the last digit in a genuine vote count is distributed in conformity with Benford's law, a systematic adding or subtracting of any constant does not cause a deviation of the falsified vote counts from Benford's law probabilities.

Appendix D. Supplementary Materials to Chapter 4

Appendix D1. The results of the analysis of electoral fraud by region and year

Table D1. Incumbent's official vote share, QR vote estimate, measures of fraud, and election observer reports by Russia's regions, the presidential election of 2012

Region	Putin V_i^I/V_i, official	Putin V_i^I/V_i, observers	N of reports	QR adjusted estimate	N of TIKs (%)	Cluster	QR fraud	MADT	MADR	$\chi^2_{LBL\%}$
Altai K.	.5794	.5114	5	.5363	41(55)	1.4	-.0990	.0671	.0247	16.1
Amur O.	.6359	.5986	3	.5893	20(69)	1.6	-.2119	.0771	.0298	19.2
Arkhangel. O.	.5853	.5541	3	.5346	25(78)	1.7	-.0297	.0713	.0325	16.7
Astrakhan O.	.6958	.6370	6	.6089	14(88)	2.2	-.4362	.0775	.0545	13.4
Belgorod O.	.5998	.5197	3	.4958	21(95)	1.8	-1.174	.0752	.0364	21.8
Bryansk O.	.6466	.5692	2	.5442	28(82)	2.1	-.8626	.0876	.0352	1.1
Vladimir O.	.5422	.5029	23	.5488	21(91)	1.2	.0015	.0531	.0226	15.2
Volgograd O.	.6404	.5929	24	.5600	42(95)	1.9	-.9765	.0726	.0390	13.9
Vologda O.	.6009	.6031	5	.5633	23(79)	1.4	-.3246	.0575	.0314	19.7
Voronezh O.	.6196	.5994	8	.5196	34(87)	1.8	-1.298	.0723	.0363	18.3
Moscow	.4794	.4605	1108	.4876	93(74)	1.2	-.4088	.0336	.0208	13.4
St. Petersburg	.5960	.5180	169	.5327	26(87)	2.2	-2.184	.0566	.0451	25.6
Jewish A.Ob.	.6254		0	.5623	3(50)	1.4	-.1879	.0835	.0238	11.4
Zabaykals. K.	.6639	.6114	1	.6021	23(61)	1.8	-.2924	.0882	.0297	15.1
Ivanovo O.	.6250	.6032	14	.5820	15(50)	1.8	-.7725	.0669	.0230	11.0
Irkutsk O.	.5609	.5066	40	.5387	38(84)	1.4	-.1247	.0668	.0263	17.1
Kab.-Balk. R.	.7773	n.a.	0	.7104	3(23)	3.5	.6254	.0447	.0144	77.0
Kaliningrad O.	.5322	.5319	5	.4452	9(38)	1.7	.1227	.0704	.0271	14.5
Kaluga O.	.5976	.5400	12	.5527	13(46)	1.6	-.3693	.0631	.0242	15.1
Kamchatka K.	.6059	n.a.	0	.5620	3(21)	1.1	-.2469	.0546	.0301	22.9
Karachay-. R.	.9155	n.a.	0	.6544[c]	0(0)	4.0	-1.485	.0364	.0233	31.2
Kemerovo O.	.7795	.6599	6	.6143	36(78)	2.5	-3.350	.0761	.0366	14.8
Kirov O.	.5860	.6088	1	.5518	21(44)	1.4	-.2408	.0580	.0273	17.9
Kostroma O.	.5325	.5119	19	.5089	10(33)	1.3	-.3820	.0471	.0275	27.4
Krasnodar K.	.6451	.5942	32	.5389	56(95)	2.1	-.8133	.0827	.0383	14.1
Krasnoyar. K.	.6092	.5924	12	.5649	53(77)	1.6	-.1552	.0663	.0267	17.3
Kurgan O.	.6396	.5489	16	.5670	26(96)	1.5	-.2232	.0767	.0339	14.8
Kursk O.	.6109	.5744	10	.5625	31(89)	1.6	-.4763	.0595	.0334	17.5
Leningrad O.	.6273	.5610	13	.5670	18 (100)	1.8	-.4596	.0719	.0377	17.6
Lipetsk O.	.6176	.5693	20	.5668	23 (100)	1.6	-.7042	.0592	.0278	19.7
Magadan O.	.5687	n.a.	0	.4905	1(10)	1.0	-.2696	.0563	.0189	12.8
Moscow O.	.5785	.5338	178	.5413	49(66)	1.5	-.4070	.0581	.0308	16.4
Murmansk O.	.6076	.6358	8	.5591	8(47)	2.7	-.3909	.0917	.0557	3.6
Nenets A.O.	.5780	n.a.	0	.5179	1(50)	2.0	-.0449	.1043	.0715	12.8
Nizh. Novg. O.	.6450	.5712	47	.5579	50(82)	1.7	-.7372	.0681	.0334	15.2
Novgorod O.	.5858	.5237	5	.5642	7(32)	1.5	-.1475	.0564	.0259	18.7
Novosibirsk O.	.5703	.5184	19	.5329	40(91)	1.4	-.0562	.0564	.0296	16.1
Omsk O.	.5627	.4508	6	.5108	35(95)	1.5	-.2420	.0728	.0326	18.8
Orenburg O.	.5747	.5160	8	.5376	46(94)	1.5	-.3601	.0593	.0314	15.9
Oryol O.	.5345	.4984	17	.4615	19(63)	1.5	-.3535	.0503	.0310	14.4
Penza O.	.6510	.5433	6	.5578	32 (100)	2.0	-2.062	.0692	.0359	14.5
Perm K.	.6384	.6027	28	.6287	41(76)	1.4	-.1776	.0572	.0248	14.5

Primorsky K.	.5812	.4222	9	.4859	29(78)	2.2	.9202	.0755	.0570	2.3
Pskov O.	.6035	.6105	2	.5595	11(42)	1.4	-.3744	.0580	.0275	16.6
Adygea R.	.6494	.6381	19	.5864	7(78)	1.8	-.4488	.0672	.0325	13.4
Altai R.	.6763	n.a.	0	.5702	8(73)	1.8	-.4104	.0787	.0385	9.9
Bashkort. R.	.7586	.6393	22	.5667	54(78)	2.9	-5.039	.0833	.0392	26.1
Buryatia R.	.6699	n.a.	0	.5521	18(72)	2.3	-.7418	.1242	.0400	14.7
Dagestan R.	.9318	n.a.	0	.6571	9(17)	3.8	-9e+10	.0355	.0201	58.6
Ingushetia R.	.9215	n.a.	0	.6598[c]	0(0)	4.0	-.3941	.0367	.0063	67.2
Kalmykia R.	.7096	n.a.	0	.6077	3(21)	1.4	-.6040	.0645	.0304	15.1
Karelia R.	.5608	.5138	22	.5374	12(60)	1.3	-.1674	.0602	.0266	13.8
Komi R.	.6589	.6706	82	.5761	19(90)	1.8	-.5425	.0580	.0368	13.0
Mari El R.	.6061	.5873	23	.5200	11(61)	1.6	-.8997	.0496	.0366	14.7
Mordovia R.	.8763	.8437	1	.6263	9(36)	3.4	-12.69	.0544	.0339	23.4
Yakutia R.	.7007	.6630	0	.5850	17(49)	1.7	-.5737	.0816	.0334	15.4
North Osse. R.	.7074	n.a.	0	.6172	5(50)	2.5	.0092	.0643	.0265	115
Tatarstan R.	.8330	.6630	12	.6004	16(25)	3.3	-17.16	.0389	.0318	36.8
Tuva R.	.9053	n.a.	0	.6339	1(5)	3.0	-1.215	.0670	.0295	8.3
Khakassia R.	.5907	n.a.	0	.5330	11(85)	1.6	-.6285	.0656	.0311	15.9
Rostov O.	.6331	.5826	59	.5556	57(92)	2.0	-.9675	.0725	.0414	16.3
Ryazan O.	.6037	.5470	5	.5435	23(72)	1.7	-.6689	.0602	.0370	17.7
Samara O.	.5935	.5392	33	.5385	38(81)	1.9	-.2952	.0568	.0290	2.4
Saratov O.	.7131	.6482	29	.5995	33(70)	2.5	-2.227	.0945	.0463	17.9
Sakhalin O.	.5701	.5447	1	.5178	5(25)	1.3	-.2159	.0533	.0312	23.5
Sverdlovsk O.	.6531	.6053	18	.6326	50(63)	1.3	-.1325	.0543	.0234	15.5
Smolensk O.	.5739	.5059	2	.5400	17(59)	1.6	-.6638	.0596	.0302	14.9
Stavropol K.	.6515	.6698	20	.5859	30(81)	1.9	-.5756	.0732	.0290	12.5
Tambov O.	.7241	n.a.	0	.5832	23(72)	2.2	-1.223	.0984	.0419	11.4
Tver O.	.5865	.5530	8	.5426	31(69)	1.5	-.3309	.0662	.0290	13.3
Tomsk O.	.5773	.5309	14	.5538	18(78)	1.3	-.1098	.0578	.0238	15.5
Tuva R.	.6847	.6003	7	.5823	24(83)	2.0	-.6733	.0934	.0361	14.3
Tyumen O.	.7371	.6533	7	.5773	21(72)	2.5	-3.533	.0535	.0570	16.3
Udmurt R.	.6652	.6118	5	.6134	29(85)	1.7	-.3939	.0587	.0242	2.5
Ulyanovsk O.	.5879	.5454	3	.5475	28(97)	1.5	-.3746	.0587	.0277	17.7
Khabarovsk K.	.5691	.5238	9	.5085	18(78)	1.5	-.2195	.0751	.0276	19.7
Khanty-. A.O.	.6724	.6393	2	.6393	11(50)	2.1	-.1637	.0545	.0177	37.9
Chelyabin. O.	.6599	.6169	55	.6208	46(90)	1.6	-.3013	.0633	.0266	16.4
Chechen R.	.9990	n.a.	0	.6410[c]	0(0)	4.0	28.291	.0011	.0004	261
Chuvash R.	.6326	.5894	14	.5494	28 (100)	2.1	-.8939	.0468	.0355	16.6
Chukotka A.O.	.7371	n.a.	0	n.a.	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
Yamalo-. A.O.	.8526	n.a.	0	.5709	2(15)	3.3	-16.50	.0282	.0427	28.1
Yaroslavl O.	.5515	.4887	1	.5132	23(88)	1.3	-.0946	.0543	.0287	12.9
Mean	.6435[a]	.5148[a]	29	.5548	1893	1.9	-1e+10	.0632	.0331	20.3
Median			6	.5517	(69)[b]	2.0	-.2944	.0582	.0292	15.3

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. The official vote share and the share based on the data of electoral observers are calculated as ratios of summed Putin's votes to summed valid votes. The data of electoral observers comes from http://ruelect.com (accessed in March 2012). QR adjusted estimate, Cluster, QR fraud, MADT, MADR, and $\chi^2_{LBL\%}$ are calculated as the means weighted by the number of eligible voters; their total means and medians are also weighted by the number of eligible voters. N of TIKs (%) denotes the number of TIKs used in the analysis for derivation of QR adjusted estimate as percentage of the total number of TIKs (in parentheses). a. The total averages are the ratios of total Putin's votes to total valid votes. b. Denotes the total number of TIKs in the analysis as percentage of the total number of TIKs (in parentheses). c. Values are imputed using predicted values from the following model, which is fitted at the level of TIKs with the limited MADT [0, 0.15] and

MADR $[0, \quad 0.1]$: $\text{Fraud} = -59.7 + 1.7\,\text{Cluster} + 89.2\,\text{Turnout} + 256.6\,\text{MADT} + 505.8\,\text{MADR} + 9.6\,\text{Cluster} \times \text{MADT} - 296.5\,\text{Turnout} \times \text{MADT} - 639.8\,\text{Turnout} \times \text{MADR} - 756.2\,\text{MADT} \times \text{MADR}$.
Model's R-squared = 0.8297. After the variable of electoral fraud has been predicted, the adjusted QR estimate is defined as the difference between the official share of the vote and the predicted value of fraud.

Table D2. Incumbent's official vote share, QR vote estimate, and measures of fraud by Russia's regions, the presidential election of 2008

Region	Medvedev V_i^I/V_i, official	QR adjusted estimate	Fraud, %	N of TIKs (%)	Clus-ter	QR fraud	MADT	MADR	$\chi^2_{LBL\%}$
Altai K.	.6133	.5912	2.2	43(60)	1.7	-.1182	.0715	.0357	15.9
Amur O.	.6509	.6098	4.1	18(64)	1.9	-.4751	.0920	.0438	19.2
Arkhangelsk O.	.6831	.6373	4.6	19(66)	1.7	-1.2228	.0667	.0256	28.6
Astrakhan O.	.7740	.7191	5.5	12(75)	2.5	-.3742	.1125	.0387	21.0
Belgorod O.	.7066	.6075	9.9	15(68)	2.1	-3.7942	.0603	.0376	27.8
Bryansk O.	.6261	.5891	3.7	21(66)	1.5	-.5727	.0689	.0268	14.2
Vladimir O.	.6444	.6431	0.1	21(91)	1.4	-.1648	.0604	.0213	16.5
Volgograd O.	.6317	.5797	5.2	31(78)	1.6	-.2895	.0833	.0353	18.5
Vologda O.	.6907	.6437	4.7	15(63)	1.6	-.4141	.0675	.0254	46.1
Voronezh O.	.6813	.6103	7.1	16(59)	1.9	-3.0006	.0807	.0390	14.7
Moscow	.7438	.6621	8.2	71(63)	2.1	-1.0718	.0744	.0220	23.9
St. Petersburg	.7356	.6697	6.6	25(83)	2.0	-.6162	.0950	.0245	23.7
Jewish A.Ob.	.6593	n.a.	65.9	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
Zabaykalsky K.	.6637	.5949	6.9	21(62)	1.8	-.6304	.0720	.0343	18.2
Ivanovo O.	.6532	.6784	-2.5	8(50)	1.3	-.0329	.0578	.0167	15.3
Irkutsk O.	.6201	.5855	3.5	37(82)	1.5	-.2727	.0733	.0310	17.4
Kab.-Balk. R.	.8890	.7076	18.1	5(38)	3.4	-8.5903	.0291	.0222	36.1
Kaliningrad O.	.6298	.6000	3.0	9(39)	1.9	-.3507	.0755	.0307	16.0
Kaluga O.	.6659	.6244	4.1	18(69)	1.6	-.4171	.0689	.0257	18.4
Kamchatka K.	.7390	.3192	42.0	1(7)	3.0	-3.9600	.0000	.2055	34.3
Karachay-Ch. R.	.9059	.6347	27.1	2(18)	3.6	-65.4751	.0346	.0201	28.8
Kemerovo O.	.7288	.6253	10.4	37(79)	1.9	-.9631	.0488	.0280	28.6
Kirov O.	.7853	.6835	10.2	35(74)	2.6	1.7678	.0974	.0385	22.5
Kostroma O.	.6302	.6156	1.5	13(57)	1.5	-.0491	.0545	.0280	24.6
Krasnodar K.	.7635	.6403	12.3	36(68)	2.4	-2.1730	.0611	.0487	21.9
Krasnoyar. K.	.6289	.6036	2.5	39(58)	1.5	-.2975	.0630	.0282	24.7
Kurgan O.	.6542	.6235	3.1	25(93)	1.7	-.0513	.0838	.0376	13.8
Kursk O.	.6789	.6258	5.3	22(71)	2.0	-1.0043	.0708	.0448	13.8
Leningrad O.	.7098	.6696	4.0	17(94)	1.9	-.3854	.1039	.0250	17.0
Lipetsk O.	.6689	.5777	9.1	23(100)	1.7	-1.3385	.0457	.0364	22.4
Magadan O.	.6399	.5314	10.8	1(10)	1.0	-.5419	.0562	.0263	27.5
Moscow O.	.7138	.6390	7.5	47(69)	2.0	-.8210	.0815	.0272	28.1
Murmansk O.	.6549	.6222	3.3	5(31)	1.9	-.2275	.0520	.0561	3.3
Nenets A.O.	.6255	.6547	-2.9	1(50)	2.0	.1991	.1411	.0467	9.6
Nizhny Novgorod O.	.6243	.5827	4.2	49(83)	1.5	-.2477	.0549	.0263	33.6
Novgorod O.	.6636	.6452	1.8	9(41)	1.4	-.3605	.0748	.0204	24.7
Novosibirsk O.	.6277	.5948	3.3	36(78)	1.4	-.2006	.0604	.0334	2.1
Omsk O.	.6425	.5695	7.3	35(95)	1.8	-.4648	.0599	.0438	37.2
Orenburg O.	.6140	.5816	3.2	46(94)	1.7	-.4124	.0794	.0388	15.1
Oryol O.	.6721	.5707	10.1	24(80)	2.2	-1.5576	.0571	.0357	21.5
Penza O.	.7497	.6397	11.0	27(87)	2.3	-2.6022	.0522	.0420	11.6
Perm K.	.6708	.6565	1.4	34(74)	1.4	-.1556	.0596	.0197	27.2
Primorsky K.	.6468	.5819	6.5	27(73)	2.2	-1.1852	.0780	.0443	22.5
Pskov O.	.7045	.6271	7.7	15(58)	1.8	-1.0001	.0643	.0267	22.0
Adygea R.	.6951	.6195	7.6	8(89)	1.7	-3.7137	.0831	.0323	18.1

Altai R.	.7470	.6624	8.5	11(100)	2.2	-.6782	.0683	.0420	19.9
Bashkortostan R.	.8885	.6892	19.9	14(21)	3.5	-16.1632	.0364	.0282	61.9
Buryatia R.	.7084	.6194	8.9	15(68)	2.4	-.8176	.1062	.0386	25.7
Dagestan R.	.9205	.7209	20.0	16(30)	3.6	6.1e+12	.0261	.0214	52.9
Ingushetia R.	.9177	.6808[c]	13.7[c]	0(0)	4.0	1.2959	.0033	.0011	16.9
Kalmykia R.	.7231	.6621	6.1	3(21)	2.0	-.8314	.0589	.0347	1.3
Karelia R.	.6807	.6644	1.6	13(65)	1.6	-.5223	.0628	.0208	18.7
Komi R.	.7255	.6536	7.2	19(90)	1.9	-.2736	.0712	.0385	16.3
Mari El R.	.7811	.6072	17.4	10(56)	2.2	-2.9161	.0411	.0286	2.6
Mordovia R.	.9081	.6449	26.3	5(20)	3.5	-39.8845	.0355	.0236	38.8
Yakutia R.	.6890	.6113	7.8	14(41)	1.8	-.1492	.0888	.0309	24.5
North Ossetia R.	.7480	.6756	7.2	7(70)	2.0	-.4827	.1058	.0470	12.9
Tatarstan R.	.8191	.6203	19.9	19(31)	3.0	3.7e+12	.0346	.0274	4.5
Tuva R.	.9037	.7551	14.9	1(5)	2.0	.1010	.1210	.0196	6.6
Khakassia R.	.6197	.6030	1.7	9(82)	1.4	-.3234	.0691	.0330	12.7
Rostov O.	.7756	.6699	10.6	55(89)	2.3	-2.3290	.0859	.0340	18.2
Ryazan O.	.6173	.5944	2.3	23(72)	1.5	-.1610	.0601	.0275	14.4
Samara O.	.6495	.6211	2.8	41(91)	1.4	-.6221	.0625	.0251	3.7
Saratov O.	.7646	.6393	12.5	32(68)	2.4	-2.4129	.1146	.0396	17.4
Sakhalin O.	.6419	.6059	3.6	12(60)	1.4	-.1971	.0697	.0254	29.9
Sverdlovsk O.	.7022	.6769	2.5	43(60)	1.2	-.1285	.0561	.0169	34.5
Smolensk O.	.6032	.5637	4.0	20(69)	1.8	-.6313	.0839	.0328	13.4
Stavropol K.	.6455	.5834	6.2	22(65)	1.8	-.5974	.0808	.0300	19.6
Tambov O.	.7488	.6531	9.6	25(78)	2.6	-1.0666	.0791	.0594	22.1
Tver O.	.6905	.6408	5.0	21(57)	2.0	-.4597	.0832	.0345	18.0
Tomsk O.	.6563	.6324	2.4	13(62)	1.4	-.2407	.0669	.0250	17.0
Tuva R.	.6857	.6259	6.0	19(68)	2.0	-.7906	.0866	.0311	14.8
Tyumen O.	.7924	.6365	15.6	8(31)	2.6	-6.7237	.0455	.0392	28.8
Udmurt R.	.7007	.6591	4.2	25(74)	1.3	-.2192	.0545	.0179	3.5
Ulyanovsk O.	.6501	.6385	1.2	19(66)	1.3	-.2595	.0461	.0213	34.5
Khabarovsk K.	.6564	.5753	8.1	8(42)	1.6	-.7915	.0644	.0246	15.2
Khanty-Mansi. A.O.	.6784	.5791	9.9	13(59)	1.4	-.1131	.0428	.0205	28.9
Chelyabin. O.	.6625	.6113	5.1	41(84)	1.3	-.1846	.0543	.0236	26.9
Chechen R.	.8878	.7310	15.7	3(15)	3.6	-.0245	.0202	.0200	36.1
Chuvash R.	.6824	.5896	9.3	16(80)	1.8	-1.4136	.0540	.0360	37.0
Chukotka A.O.	.8255	n.a	n.a.	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
Yamalo-Nenets A.O.	.8441	.6717	17.2	3(23)	2.7	-2.5307	.0633	.0584	1.7
Yaroslavl O.	.6460	.6335	1.2	19(79)	1.3	-.1422	.0559	.0200	18.3
Mean	.7122[a]	.6286	8.6	1654	1.9	1.7e+11	.0673	.0298	26.2
Median		.6284	6.5	(64)[b]	2.0	-.3554	.0571	.0249	20.4

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. The official vote share is calculated as the ratio of summed Medvedev's votes to summed valid votes. QR adjusted estimate, Cluster, QR fraud, MADT, MADR, and $\chi^2_{LBL\%}$ are calculated as the means weighted by the number of eligible voters; their total means and medians are also weighted by the number of eligible voters. N of TIKs (%) denotes the number of TIKs used in the analysis for derivation of QR adjusted estimate as percentage of the total number of TIKs (in parentheses). a. The total average is the ratio of total Putin's votes to total valid votes. b. Denotes the total number of TIKs in the analysis as percentage of the total number of TIKs (in parentheses). c. Imputed using predicted values from the following model, which is fitted at the level of TIKs with the limited MADT [0, 0.15] and MADR [0, 0.1]: $\text{Fraud} = -38.5 - 0.34\,\text{Cluster} + 68.5\,\text{Turnout} + 186.6\,\text{MADT} - 77.6\,\text{MADR} + 26.2\,\text{Cluster} \times \text{MADT} - 318.0\,\text{Turnout} \times \text{MADT} + 45.0\,\text{Cluster} \times \text{MADR} - 197.3\,\text{Turnout} \times \text{MADR}$. Model's R-squared = 0.7426. After the variable of electoral fraud has been predicted, the adjusted QR estimate is defined as the difference between the official share of the vote and the predicted value of fraud.

Table D3. Incumbent's official vote share, QR vote estimate, and measures of fraud by Russia's regions, the presidential election of 2004

Region	Putin V_i^I/V_i, official	QR adjusted estimate	Fraud, (%)	N of TIKs (%)	Clus-ter	QR fraud	MADT	MADR	$\chi^2_{LBL\%}$
Altai K.	.6877	.6329	5.5	38(54)	1.5	.0457	.0728	.0281	16.5
Amur O.	.6487	.6141	3.5	19(70)	1.7	-.1454	.0864	.0420	18.0
Arkhangelsk O.	.7762	.7047	7.1	25(83)	2.1	-.1886	.0726	.0233	31.0
Astrakhan O.	.6609	.6189	4.2	13(81)	1.6	-.3166	.0850	.0340	20.6
Belgorod O.	.5557	.5051	5.1	18(82)	1.7	-.3102	.0603	.0457	25.5
Bryansk O.	.6439	.6162	2.8	24(73)	1.4	-.0105	.0701	.0331	18.6
Vladimir O.	.6922	.6547	3.8	18(82)	1.5	-.2023	.0601	.0239	22.8
Volgograd O.	.6332	.6106	2.3	41(91)	1.5	-.0884	.0742	.0320	18.8
Vologda O.	.7650	.7002	6.5	24(86)	1.5	-.2514	.0791	.0282	33.2
Voronezh O.	.6530	.6035	4.9	28(82)	1.5	-.2487	.0868	.0315	13.6
Moscow	.6924	.6517	4.1	79(68)	1.4	-.3775	.0546	.0229	15.4
St. Petersburg	.7532	.6950	5.8	23(82)	1.8	-.0022	.0426	.0177	57.1
Jewish A.Ob.	.6862	.6339	5.2	4(67)	1.7	-.6628	.0779	.0362	15.0
Zabaykalsky K.	.7351	.6841	5.1	19(54)	1.9	-.3930	.0959	.0322	23.6
Ivanovo O.	.6772	.6493	2.8	22(73)	1.3	-.0444	.0682	.0206	14.7
Irkutsk O.	.6344	.6048	3.0	36(84)	1.5	-.1983	.0706	.0279	21.5
Kab.-Balk. R.	.9603	.6904	27.0	1(8)	3.9	-3.6294	.0107	.0236	139.5
Kaliningrad O.	.7046	.6207	8.4	10(43)	1.4	-.3394	.0618	.0278	12.7
Kaluga O.	.7013	.6592	4.2	9(45)	1.5	-.4877	.0732	.0207	16.0
Kamchatka K.	.7346	.6695	6.5	3(27)	1.1	-.3131	.0616	.0321	17.5
Karachay-Ch. R.	.8269	.6597	16.7	4(40)	2.5	-1.6703	.1093	.0413	14.6
Kemerovo O.	.7304	.6374	9.3	37(82)	2.0	-2.7e+12	.0745	.0377	18.5
Kirov O.	.6649	.6320	3.3	29(71)	1.6	-.1638	.0866	.0376	15.4
Kostroma O.	.6981	.6881	1.0	16(53)	1.6	.0071	.0715	.0311	16.8
Krasnodar K.	.6742	.6212	5.3	44(88)	1.6	-.1913	.0874	.0304	16.3
Krasnoyar. K.	.6185	.6044	1.4	51(70)	1.6	-.1515	.0717	.0281	26.7
Kurgan O.	.6740	.6446	2.9	23(88)	1.7	-.0451	.0899	.0424	16.8
Kursk O.	.6494	.5955	5.4	19(59)	1.5	-.1763	.0716	.0329	25.9
Leningrad O.	.7725	.7319	4.1	17(61)	1.9	-.7244	.0628	.0280	17.4
Lipetsk O.	.6415	.5788	6.3	16(80)	1.4	-.1280	.0507	.0290	21.5
Magadan O.	.7306	.6732	5.7	1(10)	3.0	.1633	.0000	.1412	16.9
Moscow O.	.7186	.6791	3.9	45(65)	1.5	-.4372	.0628	.0250	21.0
Murmansk O.	.7358	.6600	7.6	6(32)	2.5	-.2435	.0589	.0359	41.8
Nenets A.O.	.7654	.7295	3.6	2(100)	1.4	-.0322	.0832	.0351	13.0
Nizhny Novgorod O.	.6618	.6341	2.8	53(88)	1.5	-.2431	.0737	.0293	19.0
Novgorod O.	.7073	.6724	3.5	5(33)	1.3	-.0790	.0647	.0220	13.5
Novosibirsk O.	.6295	.6127	1.7	35(92)	1.4	-.1131	.0711	.0393	14.2
Omsk O.	.6722	.6276	4.5	31(89)	1.5	-.2464	.0788	.0379	23.6
Orenburg O.	.6004	.5729	2.7	36(86)	1.5	-.2807	.0695	.0407	15.2
Oryol O.	.6301	.5375	9.3	15(56)	1.8	-1.8300	.0572	.0483	10.9
Penza O.	.6455	.5911	5.4	19(76)	1.4	-.4321	.0638	.0325	12.1
Perm K.	.7368	.6854	5.1	41(82)	1.4	-.1849	.0654	.0248	19.7
Primorsky K.	.5939	.5527	4.1	30(81)	1.9	-.5248	.0754	.0503	24.1
Pskov O.	.7220	.6651	5.7	17(65)	1.6	-.1245	.0802	.0272	32.6
Adygea R.	.7618	.6494	11.2	6(67)	1.8	-2.5702	.0788	.0403	14.3
Altai R.	.7566	.7173	3.9	8(73)	1.8	-.6725	.0799	.0417	11.2
Bashkortostan R.	.9304	.7119	21.9	11(16)	3.4	2.2e+12	.0357	.0210	76.0
Buryatia R.	.6839	.6219	6.2	19(83)	2.0	-.7736	.0927	.0468	17.2
Dagestan R.	.9494	.7277	22.2	10(20)	3.8	1.5e+11	.0227	.0159	67.5
Ingushetia R.	.9832	.6773[c]	30.6[c]	0(0)	4.0	-34.1977	.0171	.0065	103.4
Kalmykia R.	.8027	.6843	11.8	7(50)	2.5	-2.0565	.0796	.0345	18.5
Karelia R.	.7449	.6927	5.2	14(78)	1.4	-.0426	.0729	.0241	20.4

Komi R.	.7388	.7097	2.9	19(90)	1.5	-.0856	.0696	.0269	17.2
Mari El R.	.6896	.6410	4.9	12(71)	2.1	-.5792	.0600	.0477	15.4
Mordovia R.	.9228	.6657	25.7	5(20)	3.5	-3.2e+12	.0283	.0251	58.4
Yakutia R.	.7022	.6446	5.8	11(35)	2.1	.1229	.0868	.0520	14.5
North Ossetia R.	.9198	.7922	12.8	3(33)	3.2	-1.4032	.0491	.0405	23.2
Tatarstan R.	.8381	.6762	16.2	22(37)	2.7	5.6e+12	.0583	.0320	31.1
Tuva R.	.8837	.7514	13.2	1(5)	2.0	-1.4012	.0921	.0317	20.8
Khakassia R.	.6069	.5925	1.4	6(50)	1.5	-.3717	.0683	.0352	16.9
Rostov O.	.7441	.6156	12.8	47(78)	2.2	-6.5044	.0699	.0323	29.5
Ryazan O.	.7417	.6958	4.6	24(80)	1.6	-.3100	.0628	.0269	16.0
Samara O.	.6430	.5983	4.5	32(78)	1.3	-.1994	.0584	.0233	23.1
Saratov O.	.7136	.6075	1.6	28(72)	2.4	-3.3173	.1075	.0423	17.0
Sakhalin O.	.6736	.6380	3.6	4(36)	1.1	-.2980	.0588	.0271	18.4
Sverdlovsk O.	.7702	.7286	4.2	47(64)	1.2	-.1453	.0524	.0195	25.4
Smolensk O.	.6502	.6138	3.6	16(73)	1.8	-.4050	.1054	.0399	13.2
Stavropol K.	.6438	.5913	5.3	27(73)	1.6	-.2767	.0786	.0324	14.6
Tambov O.	.6416	.5971	4.4	24(77)	1.9	-.1847	.0727	.0472	20.4
Tver O.	.7115	.6702	4.1	36(84)	1.6	-.2570	.0863	.0267	17.4
Tomsk O.	.6725	.6133	5.9	16(73)	1.3	-.0422	.0674	.0276	22.4
Tuva R.	.6645	.6363	2.8	23(82)	1.6	-.3350	.0819	.0321	22.0
Tyumen O.	.7413	.6507	9.1	23(82)	1.7	-.8957	.0531	.0396	15.8
Udmurt R.	.7695	.6936	7.6	28(82)	1.4	-.3398	.0608	.0220	18.2
Ulyanovsk O.	.6692	.6295	4.0	28(93)	1.6	-.2716	.0684	.0345	20.5
Khabarovsk K.	.6402	.5744	6.6	14(64)	1.5	-.4766	.0650	.0349	17.8
Khanty-Mansi. A.O.	.7560	.6723	8.4	10(56)	2.1	-.1973	.0522	.0152	44.7
Chelyabin. O.	.6993	.6443	5.5	39(76)	1.5	-.2386	.0596	.0292	19.2
Chechen R.	.9368	.7232	21.4	5(28)	3.5	-5.1632	.0238	.0281	34.5
Chuvash R.	.6804	.6324	4.8	24(86)	1.7	-.2721	.0569	.0384	15.5
Chukotka A.O.	.8705	.6960	17.4	2(22)	3.0	-2.6750	.1086	.0323	24.4
Yamalo-Nenets A.O.	.8505	.7124	13.8	3(23)	1.7	.0809	.0652	.0148	24.8
Yaroslavl O.	.7157	.6739	4.2	23(88)	1.3	-.1606	.0576	.0220	16.8
Mean	.7192[a]	.6443	7.0	1723	1.8	9.0e+10	.0663	.0295	25.4
Median		.6471	5.2	(67)[b]	2.0	-.1635	.0570	.0239	17.8

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. The official vote share is calculated as the ratio of summed Putin's votes to summed valid votes. QR adjusted estimate, Cluster, QR fraud, MADT, MADR, and $\chi^2_{LBL\%}$ are calculated as the means weighted by the number of eligible voters; their total means and medians are also weighted by the number of eligible voters. N of TIKs (%) denotes the number of TIKs used in the analysis for derivation of QR adjusted estimate as percentage of the total number of TIKs (in parentheses). a. The total average is the ratio of total Putin's votes to total valid votes. b. Denotes the total number of TIKs in the analysis as percentage of the total number of TIKs (in parentheses). c. Imputed using predicted values from the following model, which is fitted at the level of TIKs with the limited MADT [0, 0.15] and MADR [0, 0.1]: $\text{Fraud} = -29.2 + 0.46\,\text{Cluster} + 62.2\,\text{Turnout} + 158.6\,\text{MADT} - 145.9\,\text{MADR} + 14.5\,\text{Cluster} \times \text{MADT} - 275.8\,\text{Turnout} \times \text{MADT} + 37.1\,\text{Cluster} \times \text{MADR} - 230.4\,\text{Turnout} \times \text{MADR} + 239.7\,\text{MADT} \times \text{MADR}$. Model's R-squared = 0.7286. After the variable of electoral fraud has been predicted, the adjusted QR estimate is defined as the difference between the official share of the vote and the predicted value of fraud.

Table D4. Incumbent's official vote share, QR vote estimate, and measures of fraud by Russia's regions, the presidential election of 2000

Region	Putin V_i^I/V_i, official	QR adjusted estimate	Fraud, (%)	N of TIKs (%)	Clus-ter	QR fraud	MADT	MADR	$\chi^2_{LBL\%}$
Altai K.	.4504	.4065	4.4	34(44)	1.5	.0676	.0662	.0345	15.0
Amur O.	.4986	.4480	5.1	21(75)	1.5	.0051	.0784	.0455	12.9
Arkhangelsk O.	.6027	.5159	8.7	24(77)	2.1	-.2075	.0624	.0442	13.8
Astrakhan O.	.6163	.5689	4.7	13(81)	2.1	-.3406	.0623	.0431	16.0
Belgorod O.	.4806	.4220	5.9	21(95)	2.0	-.1475	.0704	.0475	22.1
Bryansk O.	.4335	.3773	5.6	29(85)	1.6	.1303	.0661	.0475	12.8
Vladimir O.	.5369	.5021	3.5	23(85)	1.6	-.0310	.0489	.0367	14.7
Volgograd O.	.5383	.4953	4.3	44(96)	1.8	-.0614	.0610	.0381	16.1
Vologda O.	.6737	.5962	7.7	23(82)	2.0	-.2789	.0663	.0335	24.6
Voronezh O.	.5711	.5236	4.7	36(92)	1.7	.1176	.0692	.0408	14.6
Moscow	.4657	.4330	3.3	84(69)	1.9	.0460	.0326	.0187	14.0
St. Petersburg	.6269	.5911	3.6	26(87)	2.0	.1070	.0351	.0190	23.8
Jewish A.Ob.	.4328	.3944	3.8	4(67)	1.5	-.0132	.0811	.0425	13.4
Zabaykalsky K.	.5049	.4685	3.6	25(66)	1.7	.0196	.0974	.0544	12.1
Ivanovo O.	.5357	.4924	4.3	20(67)	1.9	-.1570	.0577	.0299	14.5
Irkutsk O.	.5094	.4741	3.5	41(85)	1.8	-.1462	.0662	.0367	16.7
Kab.-Balk. R.	.7547	.5381	21.7	5(45)	3.1	-1.6862	.0630	.0528	13.2
Kaliningrad O.	.6066	.5184	8.8	7(30)	1.7	.2665	.0627	.0396	11.6
Kaluga O.	.5142	.4737	4.1	14(50)	2.0	-.2762	.0492	.0335	14.0
Kamchatka K.	.4910	.3657	12.5	2(20)	2.5	.0050	.0094	.0827	32.4
Karachay-Ch. R.	.5846	.4086	17.6	4(40)	2.7	-1.7106	.0816	.0619	9.2
Kemerovo O.	.2521	.2183	3.4	39(83)	1.7	.0069	.0554	.0241	15.2
Kirov O.	.5899	.5407	4.9	31(65)	1.9	-.0799	.0672	.0466	13.7
Kostroma O.	.5974	.5467	5.1	13(43)	1.8	.0645	.0543	.0392	16.5
Krasnodar K.	.5189	.4736	4.5	55(96)	1.6	.0289	.0636	.0339	14.8
Krasnoyar. K.	.4900	.4626	2.7	49(66)	1.8	-.0305	.0716	.0382	16.4
Kurgan O.	.4881	.4368	5.1	25(93)	1.5	-.0274	.0801	.0491	16.1
Kursk O.	.5056	.4519	5.4	30(86)	1.7	-.1284	.0612	.0526	14.4
Leningrad O.	.6713	.6289	4.2	18(67)	1.9	-.2570	.0516	.0396	14.1
Lipetsk O.	.4123	.3585	5.4	23(100)	1.3	-.2332	.0602	.0418	12.2
Magadan O.	.6235	.4976	12.6	1(11)	1.0	.2863	.1026	.0349	13.4
Moscow O.	.4835	.4593	2.4	46(63)	1.9	-.0486	.0483	.0269	17.7
Murmansk O.	.6647	.5538	11.1	7(39)	2.2	.0977	.0255	.0583	34.3
Nenets A.O.	.6008	.5419	5.9	1(100)	1.0	-.5792	.1027	.0828	1.1
Nizhny Novgorod O.	.5421	.5070	3.5	52(88)	1.7	-.0551	.0598	.0344	19.3
Novgorod O.	.6530	.5437	1.9	11(50)	1.9	-.4404	.0757	.0295	23.1
Novosibirsk O.	.4024	.3709	3.1	42(91)	1.9	-.0490	.0720	.0362	19.0
Omsk O.	.3852	.3360	4.9	26(70)	1.9	-.1390	.0756	.0482	18.8
Orenburg O.	.4562	.4204	3.6	44(86)	1.6	.0714	.0648	.0508	13.9
Oryol O.	.4615	.4071	5.4	21(70)	1.7	-.0644	.0480	.0493	12.0
Penza O.	.4987	.4521	4.7	32(89)	1.8	-.1669	.0622	.0455	14.7
Perm K.	.6179	.5728	4.5	45(78)	1.6	.0606	.0667	.0330	15.5
Primorsky K.	.4057	.3425	6.3	31(82)	1.8	-.1921	.0969	.0505	15.9
Pskov O.	.6296	.5547	7.5	14(54)	1.7	-.0546	.0737	.0342	19.9
Adygea R.	.4514	.3824	6.9	6(75)	2.1	-.1954	.0687	.0409	18.6
Altai R.	.3842	.3471	3.7	8(73)	1.8	-.1638	.0919	.0605	13.9
Bashkortostan R.	.6109	.4683	14.3	37(53)	2.5	-3.9816	.0593	.0577	16.9
Buryatia R.	.4272	.3801	4.7	17(68)	1.6	-.0779	.0904	.0409	13.1
Dagestan R.	.8165	.6244	19.2	13(25)	3.2	-1.9259	.1046	.0773	19.6
Ingushetia R.	.8607	.6938[c]	16.7[c]	0(0)	4.0	-2.6607	.0854	.0797	11.4
Kalmykia R.	.5735	.4601	11.3	2(14)	1.0	-.3656	.0514	.0481	15.4
Karelia R.	.6475	.5837	6.4	11(58)	1.9	-.2589	.0579	.0318	17.5

Komi R.	.6043	.5550	4.9	17(81)	2.0	-.1177	.0640	.0376	13.1
Mari El R.	.4504	.4005	5.0	11(65)	1.6	.0246	.0638	.0441	15.5
Mordovia R.	.6140	.4995	11.4	15(56)	2.3	-1.3831	.0539	.0609	11.6
Yakutia R.	.5309	n.a.	n.a.	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
North Ossetia R.	.6570	.5395	11.8	4(40)	2.8	-.8526	.1465	.0511	16.0
Tatarstan R.	.6995	.5639	13.6	27(44)	2.4	-4.9165	.0529	.0439	19.2
Tuva R.	.6352	.5288	1.6	1(6)	2.0	-.0646	.0633	.0201	5.3
Khakassia R.	.4290	.3962	3.3	10(91)	1.9	.0440	.0627	.0410	15.8
Rostov O.	.5376	.4689	6.9	53(85)	2.0	-.4562	.0596	.0408	13.8
Ryazan O.	.4904	.4557	3.5	27(84)	1.8	-.0527	.0655	.0453	16.8
Samara O.	.4130	.3777	3.5	37(79)	1.8	.0188	.0504	.0254	24.6
Saratov O.	.5861	.4722	11.4	23(50)	2.8	-2.0506	.0868	.0616	16.6
Sakhalin O.	.4717	.4180	5.4	7(39)	2.1	-.2100	.0959	.0289	25.3
Sverdlovsk O.	.6345	.6106	2.4	49(63)	1.8	-.0365	.0590	.0255	17.2
Smolensk O.	.5284	.4799	4.8	21(72)	1.9	-.1824	.0701	.0406	13.9
Stavropol K.	.5257	.4654	6.0	28(76)	1.7	-.1239	.0566	.0381	14.5
Tambov O.	.4860	.4523	3.4	28(88)	1.8	-.0460	.0732	.0483	12.9
Tver O.	.5806	.5114	6.9	35(76)	1.6	-.1789	.0667	.0382	12.9
Tomsk O.	.5300	.4919	3.8	18(78)	1.9	-.0080	.0697	.0343	15.3
Tuva R.	.4845	.4367	4.8	24(83)	1.6	-.1681	.0583	.0359	15.0
Tyumen O.	.5466	.4867	6.0	25(89)	1.9	-.2497	.0722	.0390	15.8
Udmurt R.	.6157	.5742	4.2	29(85)	1.7	.1674	.0538	.0353	16.7
Ulyanovsk O.	.4799	.4178	6.2	27(93)	2.0	-.2590	.0668	.0439	15.1
Khabarovsk K.	.4998	.4601	4.0	19(83)	1.8	-.0179	.0796	.0333	19.5
Khanty-Mansi. A.O.	.6122	.5486	6.4	8(36)	1.9	-.2379	.0496	.0184	28.0
Chelyabin. O.	.4945	.4542	4.0	45(88)	1.8	-.0398	.0640	.0332	18.7
Chechen R.	.5206	n.a.	n.a.	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
Chuvash R.	.4515	.4065	4.5	27(96)	2.0	-.2354	.0531	.0447	15.7
Chukotka A.O.	.6767	n.a.	n.a.	0(0)	n.a.	n.a.	n.a.	n.a.	n.a.
Yamalo-Nenets A.O.	.5949	.5332	6.2	4(31)	1.9	-.4046	.0659	.0248	11.9
Yaroslavl O.	.6411	.5936	4.8	21(81)	1.9	-.1449	.0502	.0289	15.7
Mean	.5340[a]	.4733	7.0	1890	1.7	-.3975	.0609	.0376	16.7
Median		.4704	5.2	(69)[b]	1.0	-.0032	.0544	.0263	14.8

Note: Constitutional status: R. – Republic, O. – Oblast, K. – Krai, A.O. – Autonomous Okrug, A.Ob. – Autonomous Oblast. The official vote share is calculated as the ratio of summed Putin's votes to summed valid votes. QR adjusted estimate, Cluster, QR fraud, MADT, MADR, and $\chi^2_{LBL\%}$ are calculated as the means weighted by the number of eligible voters; their total means and medians are also weighted by the number of eligible voters. N of TIKs (%) denotes the number of TIKs used in the analysis for derivation of QR adjusted estimate as percentage of the total number of TIKs (in parentheses). a. The total average is the ratio of total Putin's votes to total valid votes. b. Denotes the total number of TIKs in the analysis as percentage of the total number of TIKs (in parentheses). c. Imputed using predicted values from the following model, which is fitted at the level of TIKs with the limited MADT [0, 0.15] and MADR [0, 0.1]: $\mathrm{Fraud} = -21.7 + 0.97\,\mathrm{Cluster} + 36.5\,\mathrm{Turnout} - 68.7\,\mathrm{MADT} - 98.1\,\mathrm{MADR} + 18.1\,\mathrm{Cluster} \times \mathrm{MADT} + 123.1\,\mathrm{Turnout} \times \mathrm{MADT} + 20.3\,\mathrm{Cluster} \times \mathrm{MADR} - 213.8\,\mathrm{Turnout} \times \mathrm{MADR} - 1100.9\,\mathrm{MADT} \times \mathrm{MADR}$. Model's R-squared = 0.4264. After the variable of electoral fraud has been predicted, the adjusted QR estimate is defined as the difference between the official share of the vote and the predicted value of fraud.

Appendix D2. Replication syntax for the analysis of electoral fraud in R and SPSS

Quantile Regression: obtaining α and β by TIK

This syntax shows commands only for the presidential election of 2012. The syntax for other election years is similar.

```
# Before running the syntax, the following packages must be installed by
using install.packages("") and then loaded:[178]

library ("foreign")
library ("data.table")
library ("quantreg")
library ("stats")
library("stringr")
library("car")
library(mclust)
library("Cairo")

rm(list=ls())# removes all objects from memory

# Before opening datasets, check the working directory getwd () and set it
to setwd("D:/") if necessary.

Data <-   read.spss("D:/Presidential election 2012.sav",
use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

newdat <- subset(Data, uikintik >20 & turnoutsd>0 & putinsd>0)# selecting
the data with the number of UIKs in TIKs larger than 20 and filtering
invariable cases by choosing the TIK-level standard deviations of turnout
and Putin's vote larger than 0.

dat=data.table(newdat)

coeffi <- dat[,list( intercept.05=coef(rq(putinv_e~turnout, tau =
.05))[1], intercept.1=coef(rq(putinv_e~turnout, tau =  .1))[1],
intercept.15=coef(rq(putinv_e~turnout, tau =  .15))[1],
intercept.2=coef(rq(putinv_e~turnout, tau =  .2))[1],
intercept.25=coef(rq(putinv_e~turnout, tau =  .25))[1],
intercept.3=coef(rq(putinv_e~turnout, tau =  .3))[1],
intercept.35=coef(rq(putinv_e~turnout, tau =  .35))[1],
intercept.4=coef(rq(putinv_e~turnout, tau =  .4))[1],
intercept.45=coef(rq(putinv_e~turnout, tau =  .45))[1],
intercept.5=coef(rq(putinv_e~turnout, tau =  .5))[1],
coef.05=coef(rq(putinv_e~turnout, tau = .05))[2],
coef.1=coef(rq(putinv_e~turnout, tau = .1))[2],
coef.15=coef(rq(putinv_e~turnout, tau = .15))[2],
coef.2=coef(rq(putinv_e~turnout, tau = .2))[2],
coef.25=coef(rq(putinv_e~turnout, tau = .25))[2],
coef.3=coef(rq(putinv_e~turnout, tau = .3))[2],
coef.35=coef(rq(putinv_e~turnout, tau = .35))[2],
coef.4=coef(rq(putinv_e~turnout, tau = .4))[2],
coef.45=coef(rq(putinv_e~turnout, tau = .45))[2],
coef.5=coef(rq(putinv_e~turnout, tau = .5))[2]), by=tikgrp] # QR intercepts
and coefficients by TIK
```

[178] Comments and associated commands marked by # refer to R, * refers to SPSS.

```
write.table(coeffi, file = "foo.csv", sep = ";", dec = ",", col.names = NA,
qmethod = "double")# exporting to Excel
```

* Open *foo.csv* in SPSS (file *For QR estimate 12.sav*). Restructure cases into variables in the dataset *For QR estimate 12.sav* to obtain *For QR estimate 12 restructured.sav*:

```
GET
  FILE='D:\For QR estimate 12.sav'.
DATASET NAME DataSetQRest WINDOW=FRONT.
VARSTOCASES
  /ID=id
  /MAKE intercept FROM intercept05 intercept1 intercept15 intercept2
intercept25 intercept3 intercept35 intercept4 intercept45 intercept5
  /MAKE coef FROM coef05 coef1 coef15 coef2 coef25 coef3 coef35 coef4
coef45 coef5
  /INDEX=Index1(10)
  /KEEP=ordered tikgrp
  /NULL=KEEP.
SAVE OUTFILE='D:\For QR estimate 12 restructured1.sav'
  /COMPRESSED.
```

Closest to zero intercept

```
rm(list=ls())# removes all objects from memory

Data <-   read.spss("D:/For QR estimate 12 restructured.sav",
use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

dat <- data.table(tikgrp=Data$tikgrp, intercept=Data$intercept)

which1 <- dat[,list (which= which.min(abs(intercept - 0))), by=tikgrp]#
defines the closest to zero intercept

disaggr<-(data.frame(lapply(which1, function(x) rep(x, each = 10))))#
restructuring the data by repeating which1 by N of tau

write.table(disaggr, file = "foo.csv", sep = ";", dec = ",", col.names =
NA, qmethod = "double")# exporting to Excel
```

* Transfer variable *which1* from *foo.csv* into *For QR estimate 12 restructured.sav*. Generate selection dummy variable: *select* = 1 if *which* = *index1* (recode *index1* into *select*: all values into 1 if *Index1* = *which*):

```
GET
  FILE='D:\For QR estimate 12 restructured.sav'.
DATASET NAME DataSetQRestRestr WINDOW=FRONT.
DO IF  (Index1=which).
RECODE Index1 (ELSE=1) INTO select.
END IF.
EXECUTE.
```

* Select cases based on the selection variable with filtering unselected cases into a new dataset *QR estimate, MADT and MADR 12.sav*:

```
FILTER OFF.
USE ALL.
SELECT IF  (NOT(select=0)).
EXECUTE.
SAVE OUTFILE='D:\QR estimate, MADT and MADR 12.sav'
  /COMPRESSED.
```

* From *Presidential election 2012.sav*, add into this dataset the means of *regionnumeric*, *uikintik*, *turnout*, and *putinv_v* and the sum of *eligible* by TIK (use condition: UIKinTIK>20 and TurnoutSD>0 and PutinSD>0; and split file by TIKgrp).

```
GET
  FILE='D:\Presidential election 2012.sav'.
DATASET NAME DataSetPres12 WINDOW=FRONT.

USE ALL.
COMPUTE filter_$=(UIKinTIK>20 and TurnoutSD>0 and PutinSD>0).
VARIABLE LABELS filter_$ 'UIKinTIK>20 and TurnoutSD>0 and PutinSD>0
(FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.

SORT CASES  BY TIKgrp.
SPLIT FILE LAYERED BY TIKgrp.
DESCRIPTIVES VARIABLES=RegionNumeric UIKinTIK Eligible Turnout PutinV_V
  /STATISTICS=MEAN SUM.
```

* From *QR estimate 12.sav*, add *intercept.5* and *coef.5* to *QR estimate, MADT and MADR 12.sav*, rename *intercept* and *coef* in *interceptclosest0* and *coefclosest0*, respectively.

* Calculate QR estimate and QR fraud. *QRestimate = (1/turnout)*(interceptclosest0+coefclosest0*turnout)*. *QRfraud.5 = intercept5/(1-(intercept5+coef5))*.

```
GET
  FILE='D:\QR estimate, MADT and MADR 12.sav'.
DATASET NAME DataSetQRestAndFraud WINDOW=FRONT.

COMPUTE QRestimat=(1/Turnout)*(interceptclosest0+coefclosest0*Turnout).
EXECUTE.
COMPUTE QRfraud=intercept5/(1-(intercept5+coef5)).
EXECUTE.
```

* Check for missing values in all variables. They may result from a division by zero. Impute logically appropriate values.

```
FREQUENCIES VARIABLES=Turnout PutinV_V QRestimate intercept5 coef5
QRfraud.5
  /FORMAT=NOTABLE
  /ORDER=ANALYSIS.
```

MADT and MADR: Median absolute deviation of turnout and residuals

```
rm(list=ls())# removes all objects from memory

Data <- read.spss("D:/Presidential election 2012.sav",
use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

newdat <- subset(Data, uikintik >20 & turnoutsd>0 & putinsd>0)

datna <- newdat[!is.na(newdat$turnout),]# creating a dataset without
missing values defined by turnout (otherwise N/A will be created in TIKs
with missing cases)

dat <- data.table(datna)

madtr <- dat[,list(madt=mad(turnout), madr=mad(rq(putinv_e~turnout,
tau=.5)$residuals)),by=tikgrp]# MADT and MADR by TIK

write.table(madtr, file = "foo.csv", sep = ";", dec = ",",  col.names = NA,
qmethod = "double")# exporting to Excel
```

The variables of MADT and MADR are then transferred from *foo.csv* into *QR estimate, MADT and MADR 12.sav.*

Last-digit distributions of the incumbent's vote by TIK

```
rm(list=ls())

Data <- read.spss("D:/Presidential election 2012.sav",
use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

newdat <- subset(Data, uikintik >20 & turnoutsd>0 & putinsd>0)
dat<-data.table(newdat)

ta<-table(str_sub(dat$putinv_vbinned,-1,-1), by=dat$tikgrp)# last-digit
probabilities by TIK

write.table(ta, file = "foo.csv", sep = ";", dec = ",", col.names = NA,
qmethod = "double")# exporting to Excel
```

Transfer the probabilities into *Calculation of Chi squared for Benford law Presidential 2012 by TIK.xlsx*, calculate Chi-squared, transpose, and then insert as *ChiSquaredBenford* in *QR estimate, MADT and MADR 12.sav.*

Cluster analysis

```
rm(list=ls())

Data <-   read.spss("D:/QR estimate, MADT and MADR 12.sav ",
use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

dat <- data.table(putinv_v = Data$putinv_v, qrfraud.5=
recode(Data$qrfraud.5, "lo:-4 = -4; 1:hi = 1"), madt=recode(Data$madt,
".15:hi = .15"), madr=recode(Data$madr, "0.1:hi = 0.1"), chisquaredbenford
=recode(Data$ chisquaredbenford, "150:hi = 150"))# the extreme values
(outliers) are set to moderate levels
```

```
fit <- Mclust(dat, G=1:4)# cluster analysis
summary(fit, parameters= TRUE)# display the results
plot(fit) # plot the results

clust<-data.table(fit$ classification, fit$data)# saving the results

write.table(clust, file = "foo.csv", sep = ";", dec = ",", col.names = NA,
qmethod = "double")# exporting to Excel


#Plotting Putin's vote versus four variables of fraud by cluster:

dev.off()
Cairo(800, 800, file="plot.png", type="png", bg="white", dpi=82)
par(pty = "s", mfrow = c(2,2), col.lab = "white", cex.lab= 1.42)# four
plots in one
coordProj (dat, dimens=c(2,1), parameters = fit$parameters, z = fit$z,
what = "classification", cex.lab= 1.42)
par( col.lab = "black", cex.lab= 1.42)# four plots in one
title(xlab = "QR fraud [-4, 1]", ylab = "Putin V/V", cex.lab= 1.42)
par( col.lab = "white", cex.lab= 1.42)# four plots in one
coordProj (dat, dimens=c(3,1), parameters = fit$parameters, z = fit$z,
what = "classification", cex.lab= 1.42)
par( col.lab = "black", cex.lab= 1.42)# four plots in one
title(xlab = "MADT [0, 0.15]", ylab = "Putin V/V ", cex.lab= 1.42)
par( col.lab = "white", cex.lab= 1.42)# four plots in one
coordProj (dat, dimens=c(4,1), parameters = fit$parameters, z = fit$z,
what = "classification", cex.lab= 1.42)
par( col.lab = "black", cex.lab= 1.42)# four plots in one
title(xlab = "MADR [0, 0.1]", ylab = "Putin V/V ", cex.lab= 1.42)
par( col.lab = "white", cex.lab= 1.42)# four plots in one
coordProj (dat, dimens=c(5,1), parameters = fit$parameters, z = fit$z,
what = "classification", cex.lab= 1.42)
par( col.lab = "black", cex.lab= 1.42)# four plots in one
title(xlab = "Chi-squared LBL [0, 150]", ylab = "Putin V/V ", cex.lab=
1.42)
dev.off()
```

After that add Cluster variable to *QR estimate, MADT and MADR 12.sav*. Recode cluster variable so that it would gradually increase with the incumbent's vote.

* Select the most empirically representative TIKs by cluster. TIKs are selected based on the least absolute total deviation of *z*-values. The medians and the standard deviations are taken from Table 4.2.

```
GET
  FILE='D:\QR estimate, MADT and MADR 12.sav'.
DATASET NAME DataSetQRestAndFraud WINDOW=FRONT.

*TIKgrp = 1675 in cluster 1

COMPUTE totaldeviation1=(ABS((PutinV_V-.5638)/.0645))+(ABS((QRfraud.5--
.0428)/.2253))+(ABS((madt-.0462)/.0162))+(ABS((madr-
.0193)/.0058))+(ABS((ChiSquaredBenford-15.3)/6.9))
SORT CASES BY totaldeviation1 (A).

* TIKgrp = 1874 in cluster 2

COMPUTE totaldeviation2=(ABS((PutinV_V-.6618)/.0538))+(ABS((QRfraud.5--
.5360)/.4714))+(ABS((madt-.0754)/.0246))+(ABS((madr-
.0403)/.0116))+(ABS((ChiSquaredBenford-11.2)/3.7))
```

```
SORT CASES BY totaldeviation2 (A).

* TIKgrp = 481 in cluster 3

COMPUTE totaldeviation3=(ABS((PutinV_V-.7462)/.0940))+(ABS((QRfraud.5--
2.14)/1.309))+(ABS((madt-.0772)/.033))+(ABS((madr-
.0478)/.0184))+(ABS((ChiSquaredBenford-12.5)/6.0))
SORT CASES BY totaldeviation3 (A).

* TIKgrp = 137 in cluster 4

COMPUTE totaldeviation4=(ABS((PutinV_V-.9377)/.0957))+(ABS((QRfraud.5--
3.63)/2.05))+(ABS((madt-.0184)/.028))+(ABS((madr-
.0143)/.0193))+(ABS((ChiSquaredBenford-45.1)/44))
SORT CASES BY totaldeviation4 (A).
```

The adjustment for the QR estimate

```
rm(list=ls()
Data <-  read.spss("D:/QR estimate, MADT and MADR 12.sav",
   use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

newdat <- data.table(subset(Data, cluster==1 | cluster==2 | cluster==3))#
drop the 4th cluster

dat <- data.table(ordered=newdat$ordered,tikgrp=newdat$tikgrp,
turnout=newdat$turnout, qrestimate= newdat$qrestimate, putinv_v =
newdat$putinv_v, qrfraud.5= recode(newdat $qrfraud.5, "lo:-4 = -4; 1:hi =
1"), madt=recode(newdat $madt, "0.15:hi = 0.15"), madr=recode(newdat $madr,
"0.1:hi = 0.1"), chisquaredbenford =recode(newdat $ chisquaredbenford,
"150:hi = 150"), which=newdat$which)# the extreme values (outliers) are set
to moderate levels

# The best full-factorial interaction model of variables that should not
correlate with QR estimate:

mod<- step(lm(dat$qrestimate ~ dat$qrfraud.5+ dat$madt + dat$madr +
dat$chisquaredbenford+  dat$which + dat$turnout + dat$qrfraud.5* dat$madt +
dat$qrfraud.5* dat$madr + dat$qrfraud.5* dat$which +dat$qrfraud.5*
dat$chisquaredbenford+ dat$qrfraud.5* dat$turnout+   dat$madt* dat$madr +
dat$madt* dat$which +   dat$madt* dat$chisquaredbenford +   dat$madt*
dat$turnout+ dat$madr* dat$which + dat$madr* dat$chisquaredbenford +
dat$madr* dat$turnout +   dat$which* dat$chisquaredbenford +   dat$which*
dat$turnout +  dat$chisquaredbenford*  dat$turnout ), direction= "both")

summary(mod)

fit<-data.table(ordered=dat$ordered, tikgrp=dat$tikgrp, qrestimate
=dat$qrestimate , fitted=fitted(mod), adjustment=(0.5525 - fitted(mod)))#
saving results

write.table(fit, file = "foo.csv", sep = ";", dec = ",",col.names = NA,
qmethod = "double")# exporting to Excel
```

* Since the number of cases without the 4th cluster is smaller, to transfer results of the model, generate a variable *orderedforadj* in *QR estimate, MADT and MADR 12.sav*: recode *ordered* into the new variable using old values if *cluster* = 1:3, if *cluster* = 4 -> 2500:

```
GET
  FILE='D:\QR estimate, MADT and MADR 12.sav'.
DATASET NAME DataSetQRestAndFraud WINDOW=FRONT.
DO IF  (Cluster<4).
RECODE ordered (ELSE=Copy) INTO orderedforadj.
END IF.
EXECUTE.
RECODE orderedforadj (MISSING=2500).
EXECUTE.
```

* Sort the data according to *orderedforadj* and transfer *fitted* and *adjustment* into *QR estimate, MADT and MADR 04.sav*.

* Generate *QRestimateAdjusted = QRestimate + Adjustment*

```
COMPUTE QRestimateAdjusted=QRestimate+Adjustment.
EXECUTE.
```

Distributions of various estimates compared with Putin V/V

```
rm(list=ls())

Data <-  read.spss("D:/QR estimate, MADT and MADR 12.sav",
   use.value.labels=TRUE, max.value.labels=Inf, to.data.frame=TRUE)
colnames(Data) <- tolower(colnames(Data))

dat<- data.table(Data)

datna <- dat[!is.na(dat$qrestimateadjusted), ]# creating a dataset without
missing values defined by adjusted estimate (without the fourth cluster)

dev.off()
Cairo(600, 400, file="plot.png", type="png", bg="white", dpi=82)

plot (density(datna$ qrestimateadjusted), col="azure4", lty=1,
xlab="Incumbent's vote", xlim=c(0,1), main="Presidential election, 2012",
cex.main=1)
lines (density(dat$qrestimate), col="steelblue2", lty=5)
lines (density(dat$ putinv_v), col="coral2", lty=2)
lines (density(datna$qrestimate), col="olivedrab3", lty=6)
legend("topleft",   legend=c("QR estimate adjusted", "QR est. without 4th
cluster", "QR estimate", "Putin V/V"), col=c("azure4","olivedrab3",
"steelblue2", "coral2"), lty=c(1, 6, 5, 2), cex=0.8)
dev.off()

# Weighted by the number of eligible voters:

dev.off()
Cairo(600, 400, file="plot.png", type="png", bg="white", dpi=82)
plot (density(datna$ qrestimateadjusted, weights=datna$eligible),
col="azure4", lty=1, xlab="Incumbent's vote", ylab="Density (weighted by
Eligible)", xlim=c(0,1), main="Presidential election, 2012", cex.main=1)
lines (density(dat$qrestimate, weights=dat$eligible), col="steelblue2",
lty=5)
lines (density(dat$ putinv_v, weights=dat$eligible), col="coral2", lty=2)
lines (density(datna$qrestimate, weights=datna$eligible), col="olivedrab3",
lty=6)
legend("topleft",   legend=c("QR estimate adjusted", "QR est. without 4th
cluster", "QR estimate", "Putin V/V"), col=c("azure4","olivedrab3",
"steelblue2", "coral2"), lty=c(1, 6, 5, 2), cex=0.8)
dev.off()
```

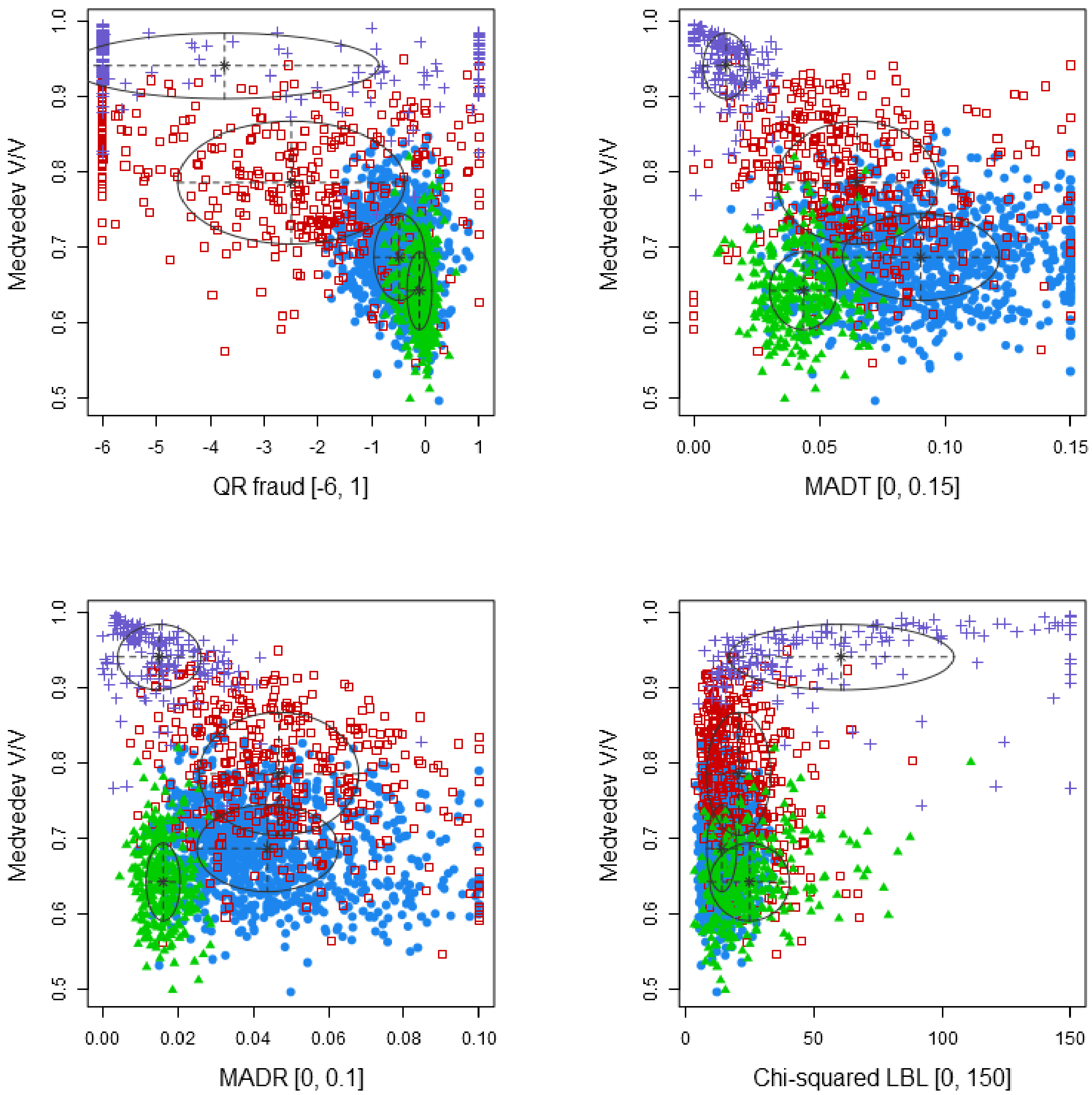
Appendix D3. The analysis of electoral fraud in the presidential election of 2008

Appendix D3, D4, and D5 iteratively repeat the approach to estimating electoral fraud developed in Chapter 4 for the presidential elections of 2008, 2004, and 2000. For reasons of parsimony, I comment the results concisely.

Cluster Analysis

The results of clasterization for the election year 2008 displayed in Figure D1 are generally similar to the results for the election year 2012.

Figure D1. The measures of electoral fraud versus the official vote share marked by clusters, 2008



Note: Ellipses indicate means (centers) and standard deviations by cluster.

The most distinct is again the 4th cluster (see mixing probabilities in Table D5), then follows the 1st cluster followed by the 3rd one, and the 2nd cluster is characterized by even greater uncertainty. The most noticeable difference is that MADT and MADR do not correlate with the incumbent's vote as clearly as they do in Figure 4.2. Therefore, the 3rd cluster is primarily defined by QR fraud, the plot of which still shows an increasing trend of cluster means with an increase in the level of Medvedev's vote.

The low performance of MADT and MADR for detecting fraud at high levels of the incumbent's vote can more plausibly be explained by a lareger degree of falsification of electoral data, especially at low levels of the vote. The large-scale electoral observation campaign of 2012 made possible to prevent fraud in several thousands of polling stations. As a result, electoral data of 2012 contain multiple observations with real election results. These results are most commonly not favorable for the incumbent, that is, the share of the vote is small and the values of MADT and MADR are small also. In the election of 2008 and in the prior election, hands of fraudsters have not been tied by observers' scrutiny. Consequently, the level of fraud could be higher. An alternative explanation suggests that, to the contrary, the election of 2008 was "cleaner" and, therefore, the relationship between MADT, MADR and Medvedev's vote weakened. However, this explanation is in conflict with indications of other variables of fraud. If it were true, we would observed (as we will see during the consideration of the election of 2000) smaller mean values of QR fraud in clusters 1–3 and smaller non-significant values of $\chi^2_{\text{LBL\%}}$. By contrast, Table D5 shows that the values of QR fraud are slightly hihger in 2008 compared with 2012 and chi-squared is significant in the 1st, 2nd, and 3rd cluster.

Table D5. Descriptive statistics for the official incumbent's vote share, QR estimate, and the measures of fraud by cluster, 2008

Cluster	Descriptive Statistics	Medvedev V_i^I/V_i	QR Estimate	QR Fraud [-6, 1]	MADT [0, 0.15]	MADR [0, 0.1]	$\chi^2_{\text{LBL\%}}$ [0, 150]	Mixing Prob-s	N
1	Mean	.6422	.6206	-.1048	.0431	.0161	24.7	.1669	316
	Median	.6381	.6157	-.0712	.0423	.0157	21.5		
	St. Dev.	.0522	.0584	.2252	.0129	.0046	15.4		
2	Mean	.6866	.6371	-.4834	.0907	.0440	13.9	.5222	952
	Median	.6872	.6337	-.4227	.0868	.0402	12.9		
	St. Dev.	.0571	.0727	.4672	.0311	.0187	5.7		
3	Mean	.7883	.7291	-2.6157	.0646	.0475	21.0	.2302	389
	Median	.7942	.7287	-2.2883	.0587	.0455	17.2		
	St. Dev.	.0803	.1087	2.0928	.0318	.0214	12.7		
4	Mean	.9391	.9264	-3.7369	.0129	.0153	59.2	.0907	172
	Median	.9482	.9373	-6.0000	.0123	.0140	43.4		
	St. Dev.	.0432	.0598	2.8766	.0091	.0110	44.0		

Note: See notes to Table 4.2. Significance levels for $\chi^2_{\text{LBL\%}}$: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$.

Adjusted QR Estimate

The best interaction effects model for defining the adjustment for the QR estimate is reported in Table D6. The model explains 55.4% of the QR estimate's variance.

Table D6. The best OLS interaction effects model of the QR estimate on four measures of fraud, regression quantile, and turnout; 2008

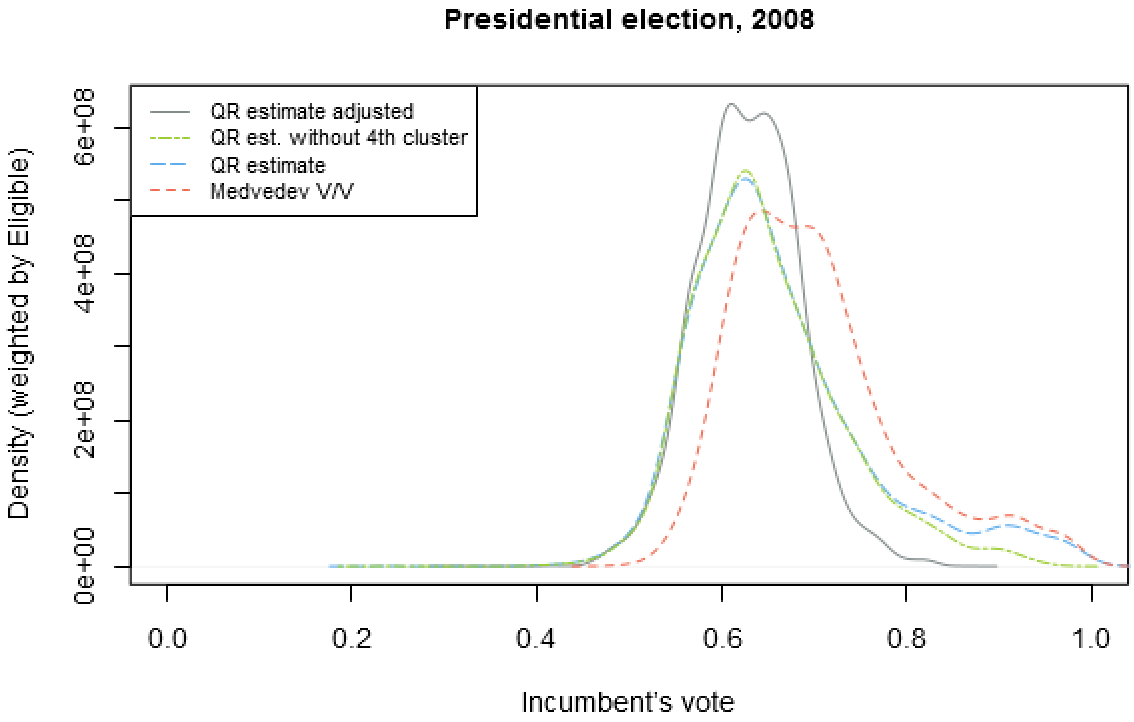
DV: QR Estimate	Coefficient	Std. Error	t-value
(Intercept)	.2246	.0425	5.29***
QR fraud [-6, 1]	.0179	.0156	1.15
MADT [0, 0.15]	1.9317	.3833	5.04***
MADR [0, 0.1]	-.1988	.6412	-.31
$\chi^2_{LBL\%}$ [0, 150]	.0019	.0010	1.97*
Tau	-.0091	.0039	-2.30*
Turnout	.6301	.0607	10.38***
QR fraud [-6, 1] × MADT [0, 0.15]	-.2324	.0466	-4.99***
QR fraud [-6, 1] × Tau	-.0008	.0004	-2.17*
QR fraud [-6, 1] × Turnout	-.0253	.0162	-1.56
MADT [0, 0.15] × Tau	.0458	.0154	2.98**
MADT [0, 0.15] × $\chi^2_{LBL\%}$ [0, 150]	.0159	.0039	4.06***
MADT [0, 0.15] × Turnout	-3.3160	.5147	-6.44***
MADR [0, 0.1] × Tau	.0631	.0294	2.15*
MADR [0, 0.1] × $\chi^2_{LBL\%}$ [0, 150]	-.0145	.0068	-2.12*
MADR [0, 0.1] × Turnout	-2.3850	.7829	-3.05**
Tau × Turnout	.0211	.0059	3.58***
$\chi^2_{LBL\%}$ [0, 150] × Turnout	-.0030	.0014	-2.18*
R-squared	.554		
N	1657		

Note: See comments to Table 4.3. Significance codes: *p < 0.05, **p < 0.01, ***p < 0.001.

As a result, the adjusted QR estimate in Figure D2, especially its right tail, differs substantively from both the non-adjusted estimate and the official Medvedev's vote share. The adjusted QR estimate is again is nearly normally distributed except two small peaks at the top of the distribution. The mean adjusted QR estimate (62.9%) is smaller than the official share of the vote (71.2%) by 8.3% – the estimated amount of fraud in the election.

Table D2 reports the results of the analysis of electoral fraud by region. QR estimates are missing in three regions: there are too small numbers of UIKs in TIKs (< 20) in Chukotka and Jewish Autonomous Oblast; all observations from Ingushetia are of the 4th cluster. In five regions, the adjusted estimates are based only on one or two TIKs; in six regions – on three to five. The reliable estimates are obtained for 64% of all TIKs. Regions-leaders of electoral forgery appeared to be almost the same in this election as in 2012. According to the level of fraud, they include: Kamchatka Krai (42.0% – yet only one TIK in analysis), Karachay-Cherkessia (27.1%), Mordovia (26.3%), Dagestan (20.0%), Bashkortostan (19.9%), Tatarstan (19.9%), and Kabardino-Balkaria (18.1%). Perhaps, most surprisingly, Chechnya appeared in this list with its 15.7% of fraud and 73.1% of the initial vote; and this estimate is based on 3 out of 15 TIKs in the region. Obviously, the presidential election of 2008 in Chechnya has been manipulated in a lesser degree than in 2012. However, there is not a good reason for optimism. The quantitative amount of fraud is large and the mean cluster in the region (3.6) indicates that, in qualitative terms, the level of fraud is just slightly below the complete artificiality of data.

Figure D2. The distributions of Putin's QR-based estimates and the official vote share, 2008



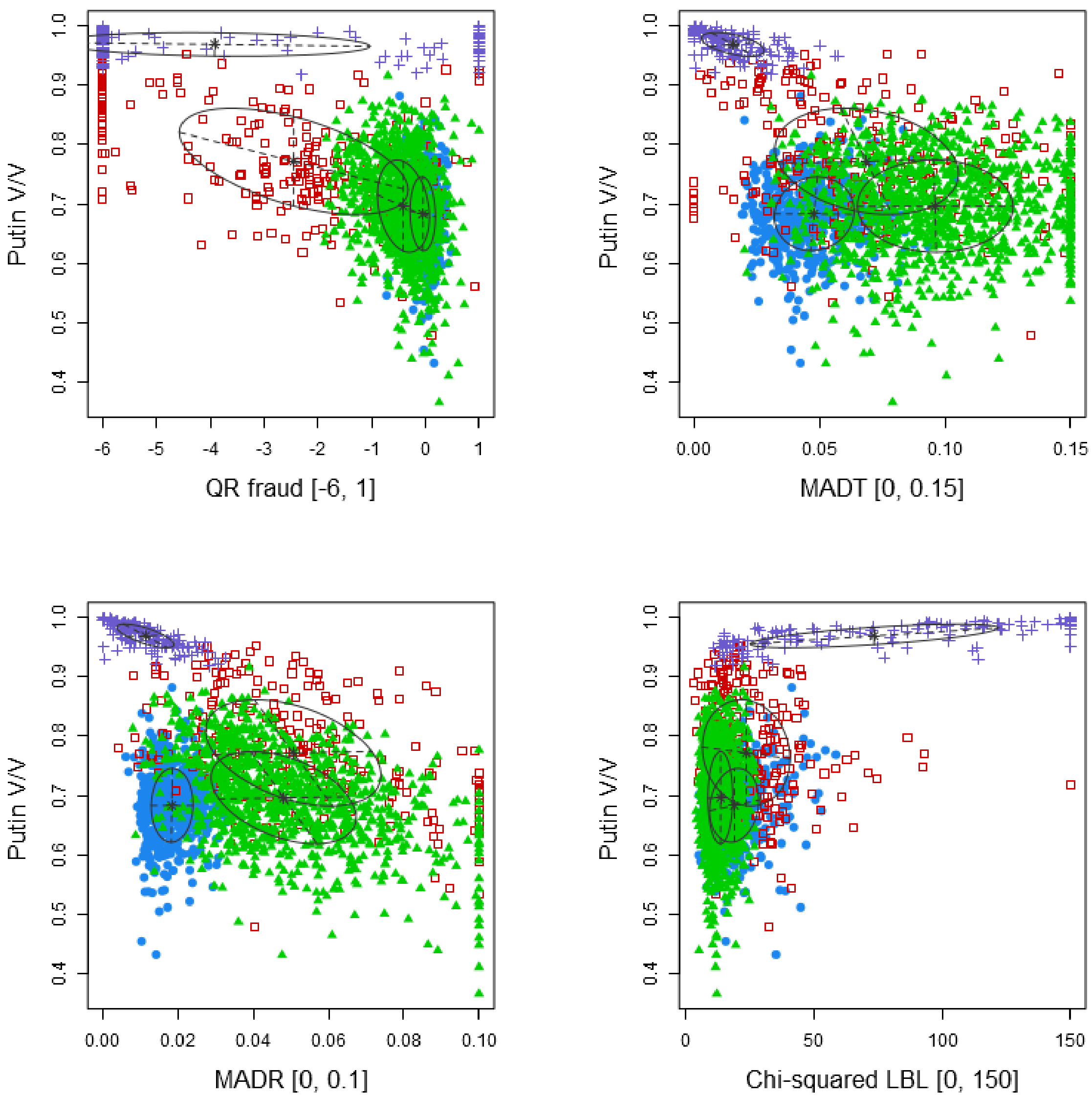
Note: For the adjusted QR estimate and the QR estimate without the 4th cluster, non-weighted N = 1657, for both other distributions non-weighted N = 1829.

Appendix D4. The analysis of electoral fraud in the presidential election of 2004

Cluster Analysis

For the election of 2004, the results of the cluster analysis that appear in Figure D3 and Table D7 are similar to the results of 2008. MADT and MADR do already not have and QR fraud is beginning to lose its discriminating power. The 4th cluster is again identified with the highest degree of certainty due to large and significant values of $\chi^2_{LBL\%}$ and extraordinarily small values of MADT and MADR; the 3rd cluster is now more distinct than the 1st one; and the 2nd cluster is again characterized by the least certainty (see mixing probabilities in Table D7). The number of cases in the 3rd and 4th clusters decreased.

Figure D3. The measures of electoral fraud versus the official vote share marked by clusters, 2004



Note: Ellipses indicate means (centers) and standard deviations by cluster.

All these attributes may indicate that the level of fraud was smaller in the election of 2004. However, the averages of QR fraud show a perceptible reduction only in the 1st cluster and $\chi^2_{LBL\%}$ is significant in all clusters except the 2nd one. Therefore, we may preliminary conclude that the amount of fraud was sizable enough but it was probably smaller than in the election of 2008.

Table D7. Descriptive statistics for the official incumbent's vote share, QR estimate, and the measures of fraud by cluster, 2004

Cluster	Descriptive Statistics	Putin V_i^I/V_i	QR Estimate	QR Fraud [-6, 1]	MADT [0, 0.15]	MADR [0, 0.1]	$\chi^2_{LBL\%}$ [0, 150]	Mixing Prob-s	N
	Mean	.6824	.6582	-.0431	.0475	.0183	18.9		
1	Median	.6825	.6590	-.0020	.0451	.0175	16.8	.2475	469
	St. Dev.	.0611	.0672	.2310	.0158	.0053	9.6		
	Mean	.6969	.6461	-.4130	.0965	.0485	13.5		
2	Median	.6995	.6475	-.3388	.0946	.0445	12.7	.535	1005
	St. Dev.	.0780	.0943	.4808	.0306	.0192	4.8		
	Mean	.7748	.7116	-2.6157	.0673	.0509	24.2		
3	Median	.7690	.7067	-2.2131	.0640	.0480	18.6	.1461	249
	St. Dev.	.0895	.1157	2.1217	.0367	.0234	17.4		
	Mean	.9678	.9596	-3.9096	.0155	.0114	73.1		
4	Median	.9725	.9696	-6.0000	.0129	.0096	66.6	.0714	134
	St. Dev.	.0201	.0356	2.9018	.0125	.0075	48.5		

Note: See notes to Table 4.2. Significance levels for $\chi^2_{LBL\%}$: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$.

Adjusted QR Estimate

Table D8 displays that the QR estimate changes under the influence of the four variables of fraud, the regression quantile, and turnout. Overall, these variables and their interaction effects account for 43.8% of the variance of the QR estimate. This proportion is relatively large.

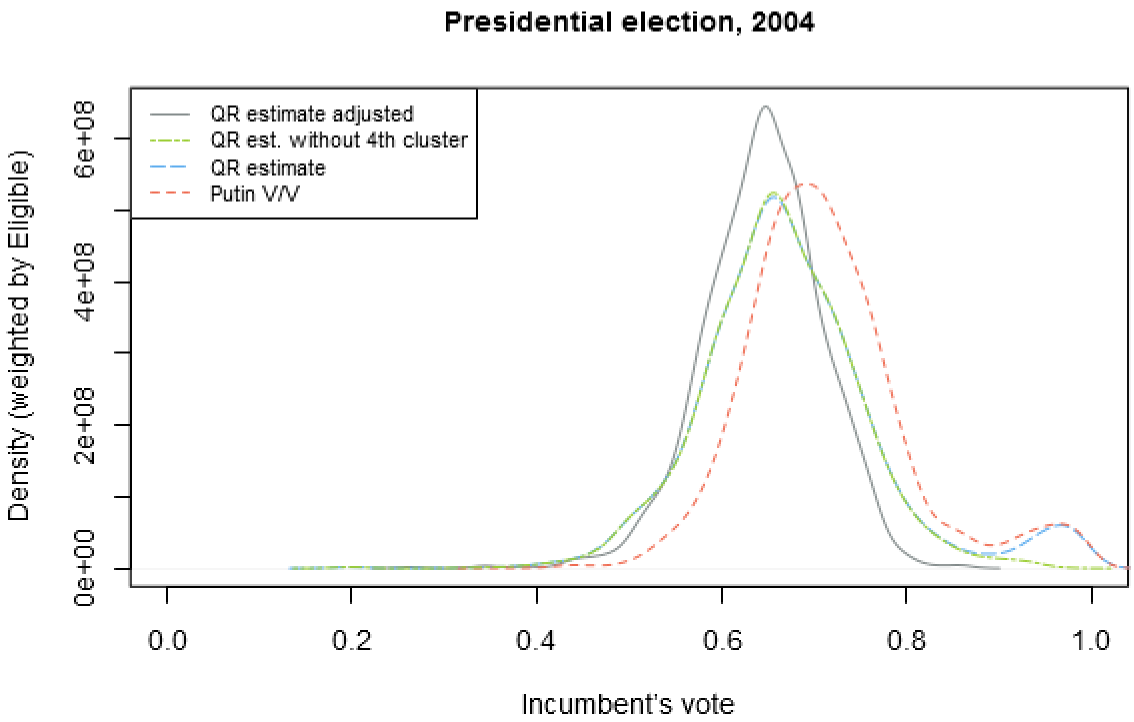
Table D8. The best OLS interaction effects model of the QR estimate on four measures of fraud, regression quantile, and turnout; 2004

DV: QR Estimate	Coefficient	Std. Error	t-value
(Intercept)	0,3171	0,0357	8,89***
QR fraud [-6, 1]	0,0024	0,0055	0,43
MADT [0, 0.15]	1,5120	0,3941	3,84***
MADR [0, 0.1]	-1,6170	0,6866	-2,36*
$\chi^2_{LBL\%}$ [0, 150]	0,0014	0,0004	3,02**
Tau	0,0050	0,0016	3,24**
Turnout	0,5674	0,0530	10,70***
QR fraud [-6, 1] × MADT [0, 0.15]	-0,1391	0,0447	-3,11**
QR fraud [-6, 1] × MADR [0, 0.1]	-0,1615	0,0836	-1,93.
QR fraud [-6, 1] × Tau	-0,0015	0,0005	-3,34***
MADT [0, 0.15] × Turnout	-2,1280	0,5651	-3,77***
MADR [0, 0.1] × Tau	0,1934	0,0264	7,33***
MADR [0, 0.1] × $\chi^2_{LBL\%}$ [0, 150]	-0,0111	0,0077	-1,43
MADR [0, 0.1] × Turnout	-2,5740	0,9059	-2,84**
$\chi^2_{LBL\%}$ [0, 150] × Tau	-0,0001	0,0001	-1,76.
R-squared	.4378		
N	1723		

Note: See comments to Table 4.3. Significance codes: .p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.

The distributions QR estimates and the official share of the vote in Figure D3 follow the same general patters as in the elections of 2008 and 2012. The specificity of the official vote share is that its main part is more normal-shaped than the distributions of the following years. On the other hand, the abnormal peak in the range of 90–100% of the vote is most salient in this election. Supposedly, electoral fraud has not been as widespread in 2004 as it occurred in future, yet electoral fraud in ethnic republics has already been extreme.

Figure D4. The distributions of Putin's QR-based estimates and the official vote share, 2004



Note: For the adjusted QR estimate and the QR estimate without the 4th cluster, non-weighted N = 1723, for both other distributions non-weighted N = 1857.

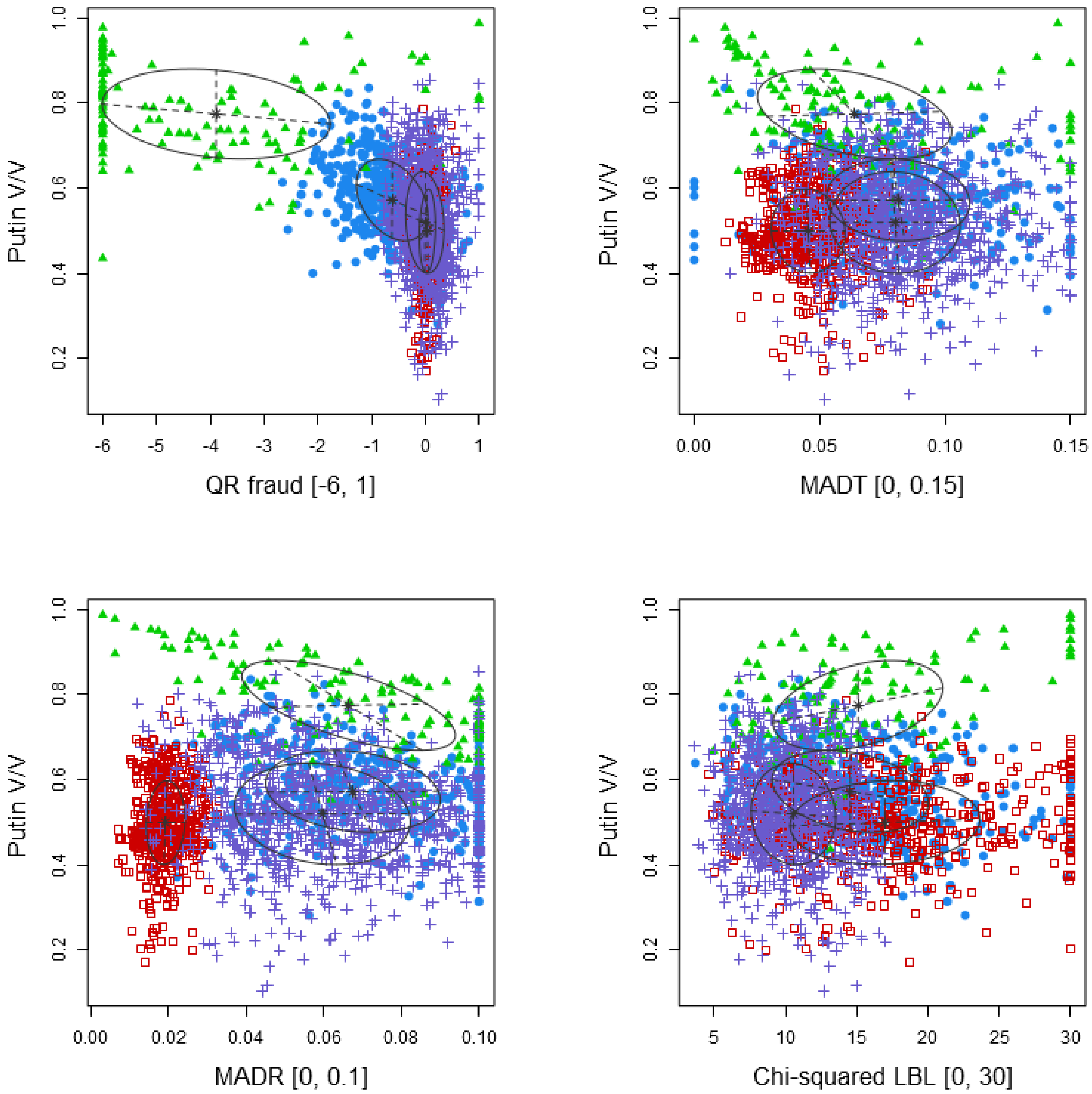
The adjusted QR estimates are obtained for 67% of all TIKs (see Table D3). The estimate is undefined for Ingushetia where all observations belong to the 4th cluster. In five regions, the estimate is based on only one or two TIKs; in nine regions – on three to five. The top list of fraud contains already known regions: Kabardino-Balkaria (27.0% of fraud, yet only one TIK in analysis), Mordovia (25.7%), Dagestan (22.2%), Bashkortostan (21.9%), Chechnya (21.4%), Chukotka (17.4%), Karachay-Cherkessia (16.7%), and Tatarstan (16.2%). The total amount of fraud in the election of 2004 is estimated at 7.5%.

Appendix D5. The analysis of electoral fraud in the presidential election of 2000

Cluster Analysis

The results of cluster analysis for the election of 2000 in Figure D5 show a different picture compared with the results of the following election years.

Figure D5. The measures of electoral fraud versus the official vote share marked by clusters, 2000



Note: Ellipses indicate means (centers) and standard deviations by cluster.

MADT, MADR, and $\chi^2_{LBL\%}$ do not correlate with the incumbent's vote. The correlation is present only on the scale of QR fraud and it is determined only by the 3rd and the 4th clusters. Furthermore, the average values of QR fraud, as indicated in Table D9, are close to zero in the 1st and the 2nd cluster; the mean of the 3rd cluster is about threefold smaller than the means of QR fraud in the elections of 2004–2012. Only the average QR fraud in the 4th cluster is high. It exceeds even the 4th cluster's means of the subsequent election years but primarily due to the lack of extremely positive values on the QR fraud scale. Apart from this, the QR estimate is nearly constant between clusters 1 to 3. Even in the 4th cluster, the QR estimate is lower than the level of the official vote by 8.8%, whereas the maximal difference in the subsequent elections is observed in 2012 an equal to 1.6%. In other words, the level of electoral distortion in the 4th cluster is not high enough to let the QR estimate converge with the official vote share as it is observed in the subsequent elections.

Table D9. Descriptive statistics for the official incumbent's vote share, QR estimate, and the measures of fraud by cluster, 2000

Cluster	Descriptive Statistics	Putin V_i^I/V_i	QR Estimate	QR Fraud [-6, 1]	MADT [0, 0.15]	MADR [0, 0.1]	$\chi^2_{LBL\%}$ [0, 30]	Mixing Prob-s	N
1	Mean	.4992	.4775	.0340	.0455	.0192	16.8	.246	516
	Median	.4909	.4715	.0333	.0436	.0186	15.9		
	St. Dev.	.0967	.0998	.1717	.0146	.0049	6.7		
2	Mean	.5227	.4722	-.0032	.0809	.0606	10.5	.4684	977
	Median	.5217	.4702	-.0098	.0785	.0595	10.5		
	St. Dev.	.1194	.1410	.3439	.0258	.0222	2.9		
3	Mean	.5772	.4932	-.7129	.0810	.0688	15.0	.2189	397
	Median	.5755	.4897	-.7524	.0796	.0665	14.9		
	St. Dev.	.0962	.1226	.6597	.0286	.0220	5.5		
4	Mean	.7836	.6952	-4.2087	.0626	.0658	15.3	.0667	122
	Median	.7900	.6749	-4.7650	.0544	.0669	13.6		
	St. Dev.	.1039	.1727	1.9653	.0396	.0282	6.1		

Note: See notes to Table 4.2. Significance levels for $\chi^2_{LBL\%}$: 14.69 – $p < 0.1$, 16.92 – $p < 0.05$, 21.67 – $p < 0.01$, 27.88 – $p < 0.001$.

This indicates that the amount of electoral fraud has been markedly smaller in the election of 2000. However, the election has not been free of fraud at all. Although the 4th cluster includes a smaller number of observations, this cluster of extreme fraud is still the most distinct (mixing probability = 0.0667). The means of MADT and MADR in the 2nd and 3rd cluster are about twice larger than in the 1st cluster. These oversized variances indicate that electoral fraud took place in observations of the 2nd and 3rd clusters. Specifically, the values of MADR in clusters 2, 3, and especially 4 are the largest compared with all subsequent elections. It means that, first, the most widespread type of fraud in these clusters was counting excessive number of votes in favor of the incumbent without affecting the number of valid votes (i.e., not changing the turnout). Second, since not only MADR but also MADT are atypically large in the 4th cluster, the average type and degree of fraud in this cluster can be compared with type and scope of fraud in the average 3rd cluster of the subsequent elections. Appendix D8 and Figure 4.3 show this difference graphically on the most typical TIKs by cluster and election year.

Adjusted QR Estimate

Table D10 confirms this suggestion. The explanatory power of the model used for defining the adjustment decreased nearly twofold compared with the models for election years 2008 and 2012.

Table D10. The best OLS interaction effects model of the QR estimate on four measures of fraud, regression quantile, and turnout; 2000

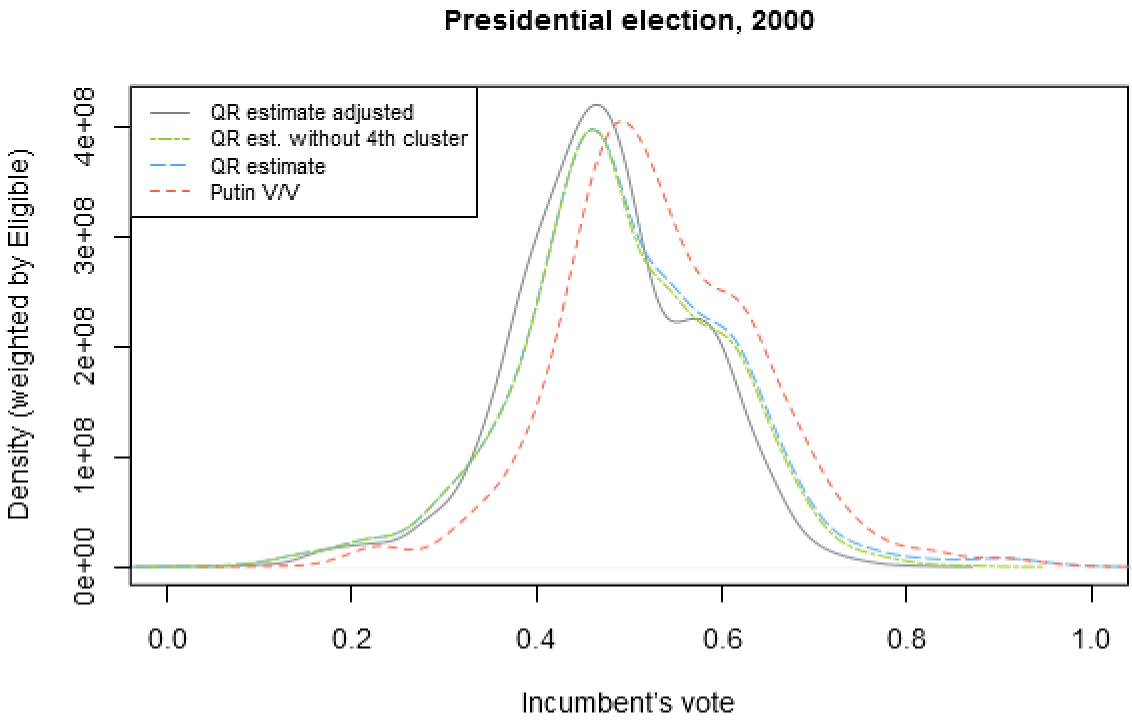
DV: QR Estimate	Coefficient	Std. Error	t-value
(Intercept)	.2460	.0869	2.83**
QR fraud [-6, 1]	.1909	.0647	2.95**
MADT [0, 0.15]	.0780	.3096	.25
MADR [0, 0.1]	.8928	1.1126	.8
Tau	-.0128	.0101	-1.28
Turnout	.3457	.1284	2.69**
QR fraud [-6, 1] × MADT [0, 0.15]	-.6616	.2109	-3.14**
QR fraud [-6, 1] × MADR [0, 0.1]	.5279	.2626	2.01*
QR fraud [-6, 1] × Turnout	-.3192	.0872	-3.66***
MADT [0, 0.15] × MADR [0, 0.1]	-1.9820	3.4992	-3.14**
MADT [0, 0.15] × Tau	.0553	.0334	1.65.
MADR [0, 0.1] × Tau	.2056	.0442	4.65***
MADR [0, 0.1] × Turnout	-3.5963	1.4406	-2.50*
Tau × Turnout	.0216	.0151	1.43
R-squared	.2738		
N	1890		

Note: See comments to Table 4.3. Significance codes: .p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.

Accordingly, the distribution of the adjusted QR estimate shown in Figure D6 differs only slightly from the non-adjusted estimate. Although all distributions in the figure are bimodal, the bimodality more likely appears as a result of heterogeneity of preferences in the electorate rather than as a result of electoral manipulation. First, the analysis of electoral fraud does not detect massive electoral forgery. Second, the leaders on the scale of electoral fraud in 2000, similarly as in the following election years, were ethnic republics: Kabardino-Balkaria (21.7%), Dagestan (19.2%), Karachay-Cherkessia (17.6%), Bashkortostan (14.3%), and Tatarstan (13.6%) (see Table D4). However, according to the level of sincere vote measured by the adjusted QR estimate, the ethnic regions were the most heterogeneous in 2000: exactly 50% of them voted for Putin at rates higher than the median. This proportion has increased subsequently and amounted 75% in 2004, 65% in 2008, and 72.2% in 2012. Non-ethnic (predominantly Russian) regions, to the contrary, decreased their estimated shares of the incumbent's vote relatively to the median. In 2000, the estimated vote share in 50.8% of them was above the median, in 2004 – 41.9%, in 2008 – 43.3%, in 2012 – 44.3%. Put otherwise, Russian and ethnic regions voted for Putin in almost equal proportions. We may find in the area of the highest peak with equal probabilities Rostov (the adjusted QR estimate = 46.9%), Smolensk (48.0%), and Ivanovo Oblasts (49.2%) together with

Republics of Kalmykia (46.0%), Bashkortostan (46.8%), and Mordovia (50.0%). In the area of the second lower peak we may observe Perm Krai (57.3%), Saint Petersburg (59.1%), and Vologda Oblast (59.6%) together with Republics of Udmurtia (57.4%), Karelia (58.4%), and Dagestan (62.4). Such neighborhood would have been highly improbable in the subsequent election years.

Figure D6. The distributions of Putin's QR-based estimates and the official vote share, 2000

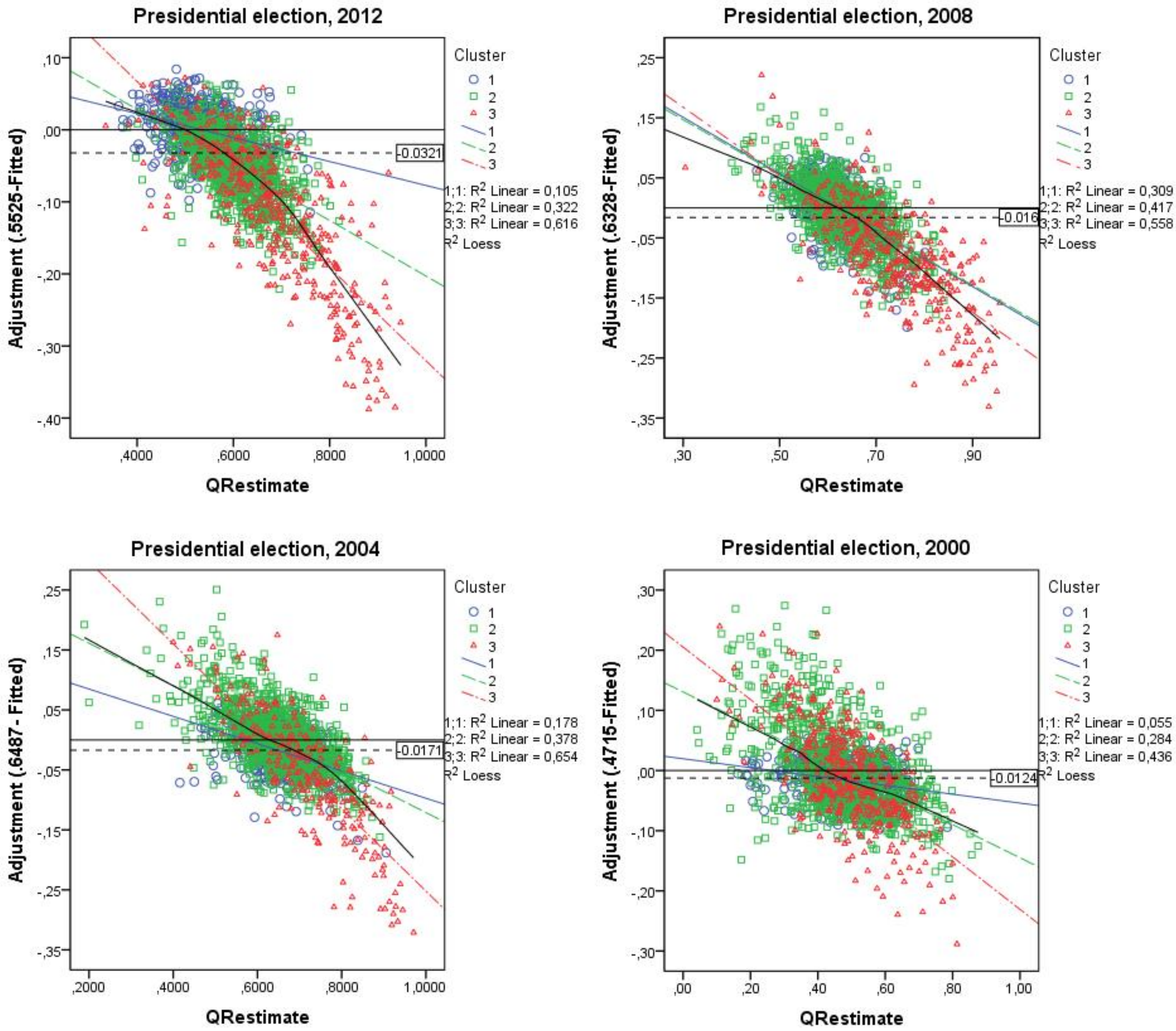


Note: For the adjusted QR estimate and the QR estimate without the 4th cluster, non-weighted N = 1890, for both other distributions non-weighted N = 2012.

The adjusted QR estimate is not obtained in four regions: in Chukotka, Yakutia, and Chechnya due to the small number of observations (UIKs in TIKs < 20) and in Ingushetia because of extreme fraud (the mean cluster = 4). The adjusted QR estimate is equally based on one and two TIKs and on three to five TIKs in five regions. Overall, the estimates are obtained in 69% of all TIKs.

Appendix D6. The relationship between the QR estimate and the adjustment by election year

Figure D7. The QR estimate's adjustment plotted against the QR estimate by election year

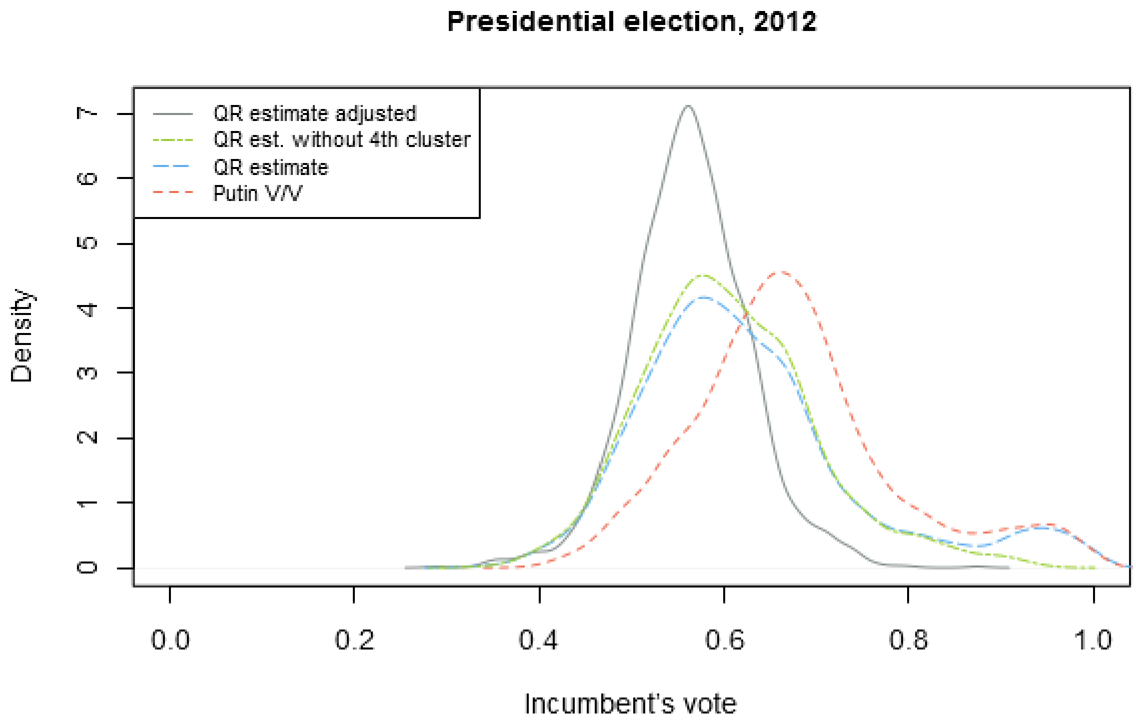


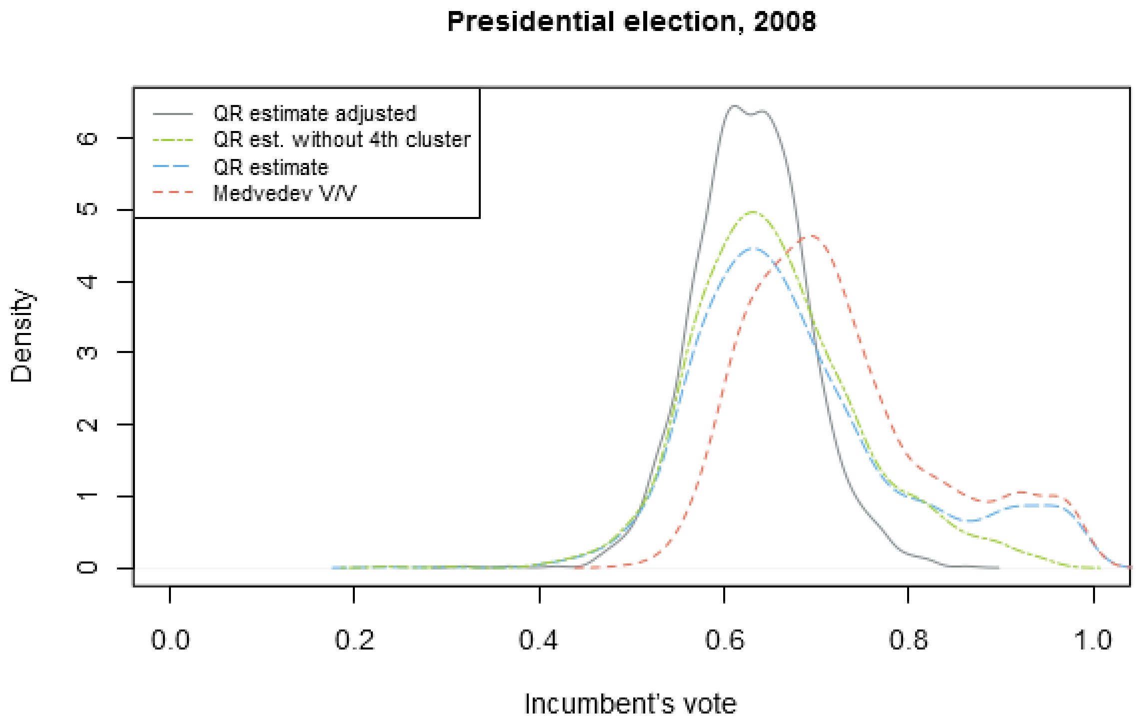
Note: Horizontal dashed lines indicate the means weighted by the number of eligible voters.

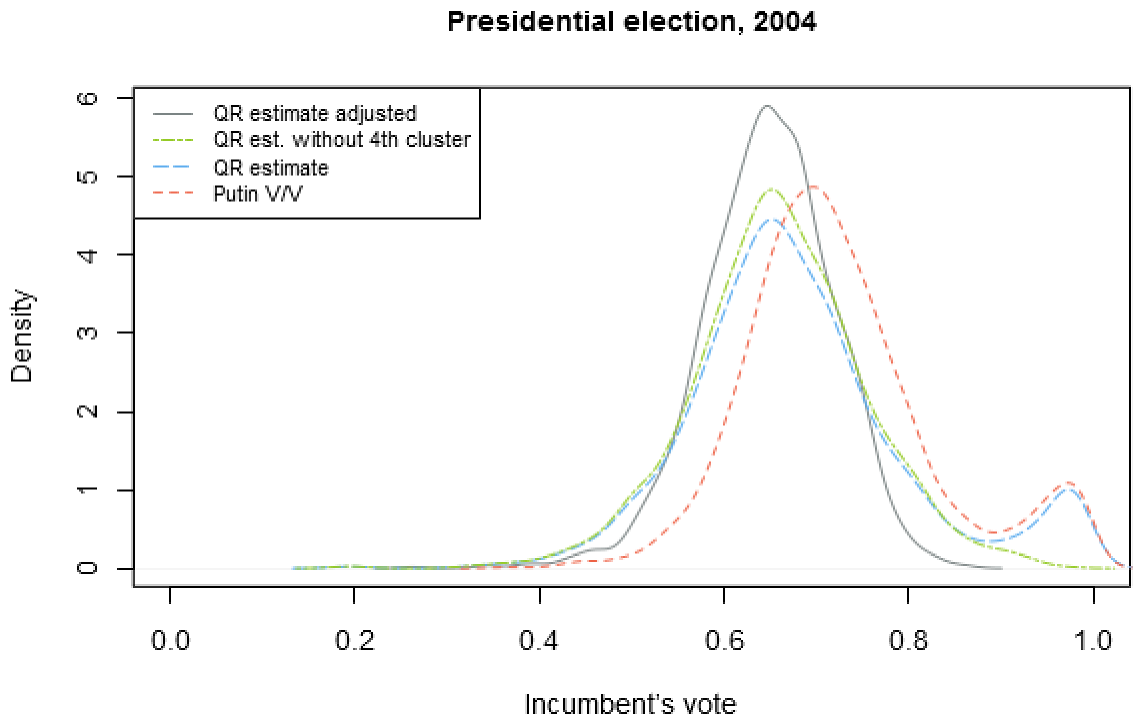
The correlation between the QR estimate and its adjustment increases from 2000 to 2012 together with explanatory power of the models in Table D6, D8, D10, and 4.2. The strength of the relationship also varies markedly by cluster. It increases from the 1st to the 3rd cluster (the election of 2008 in an exception, the fit lines of the 1st and the 2dn cluster do almost coincide). The difference in means is greatest in the presidential election of 2012, therefore, the average adjustment diverges the most from zero in 2012.

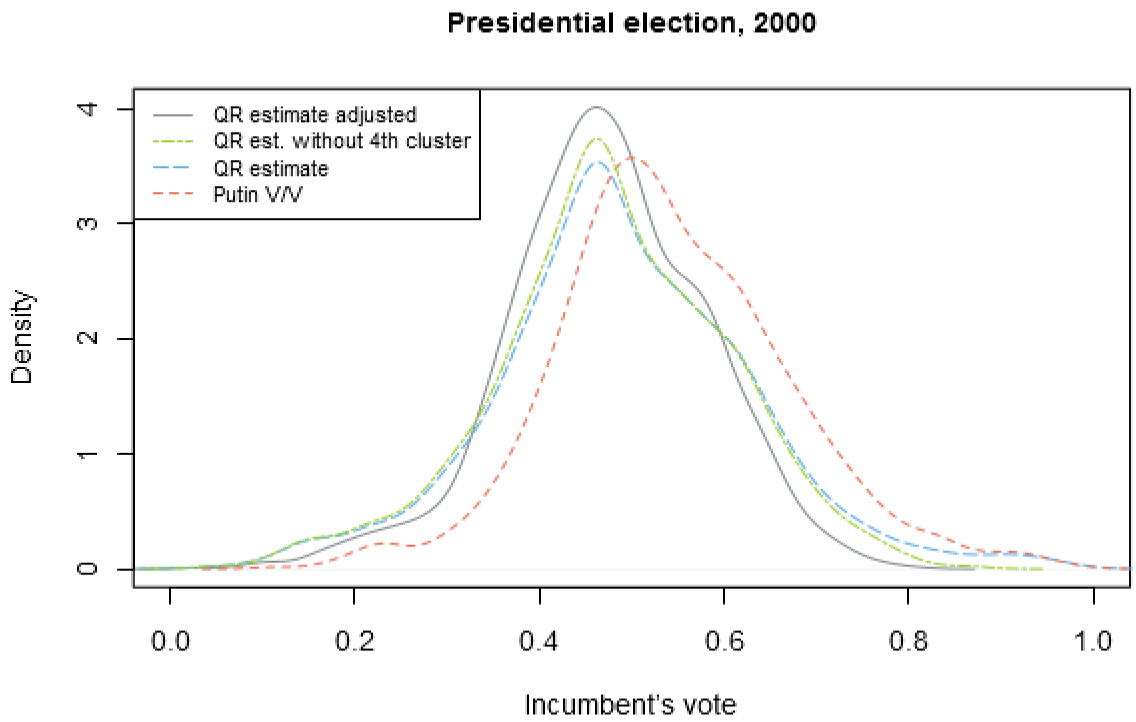
Appendix D7. Non-weighted distributions of QR estimates and the incumbent's vote

Figure D8–D11. The distributions of Putin's QR-based estimates and the official vote share (cases are not weighted), 2000–2012





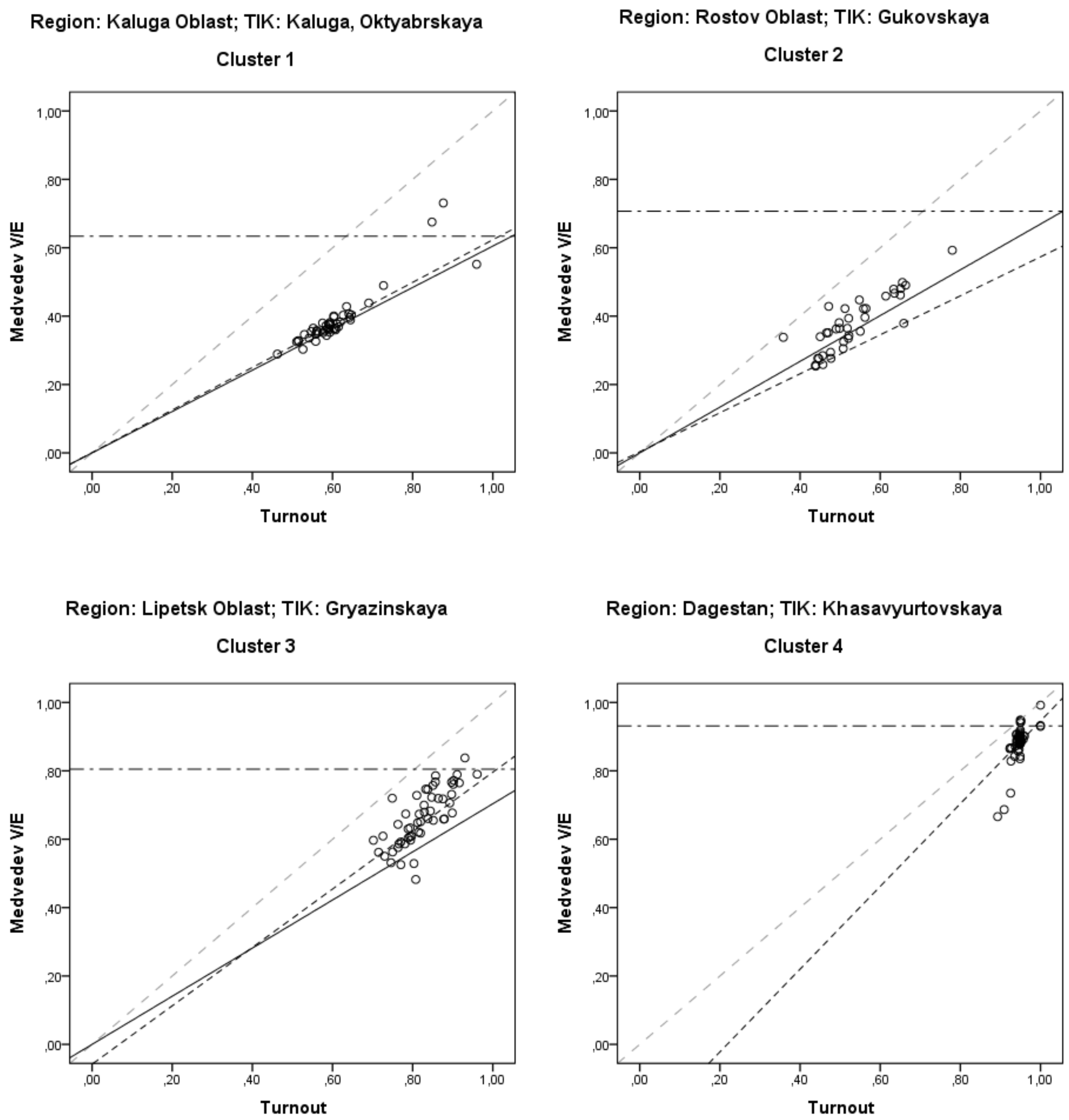

Presidential election, 2004
QR estimate adjusted
QR est. without 4th cluster
QR estimate
Putin V/V
Density
0
1
2
3
4
5
6
0.0
0.2
0.4
0.6
0.8
1.0
Incumbent's vote


Presidential election, 2000
QR estimate adjusted
QR est. without 4th cluster
QR estimate
Putin V/V
Density
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
Incumbent's vote

Appendix D8. The most typical “fingerprints” of fraud by cluster, 2000–2008

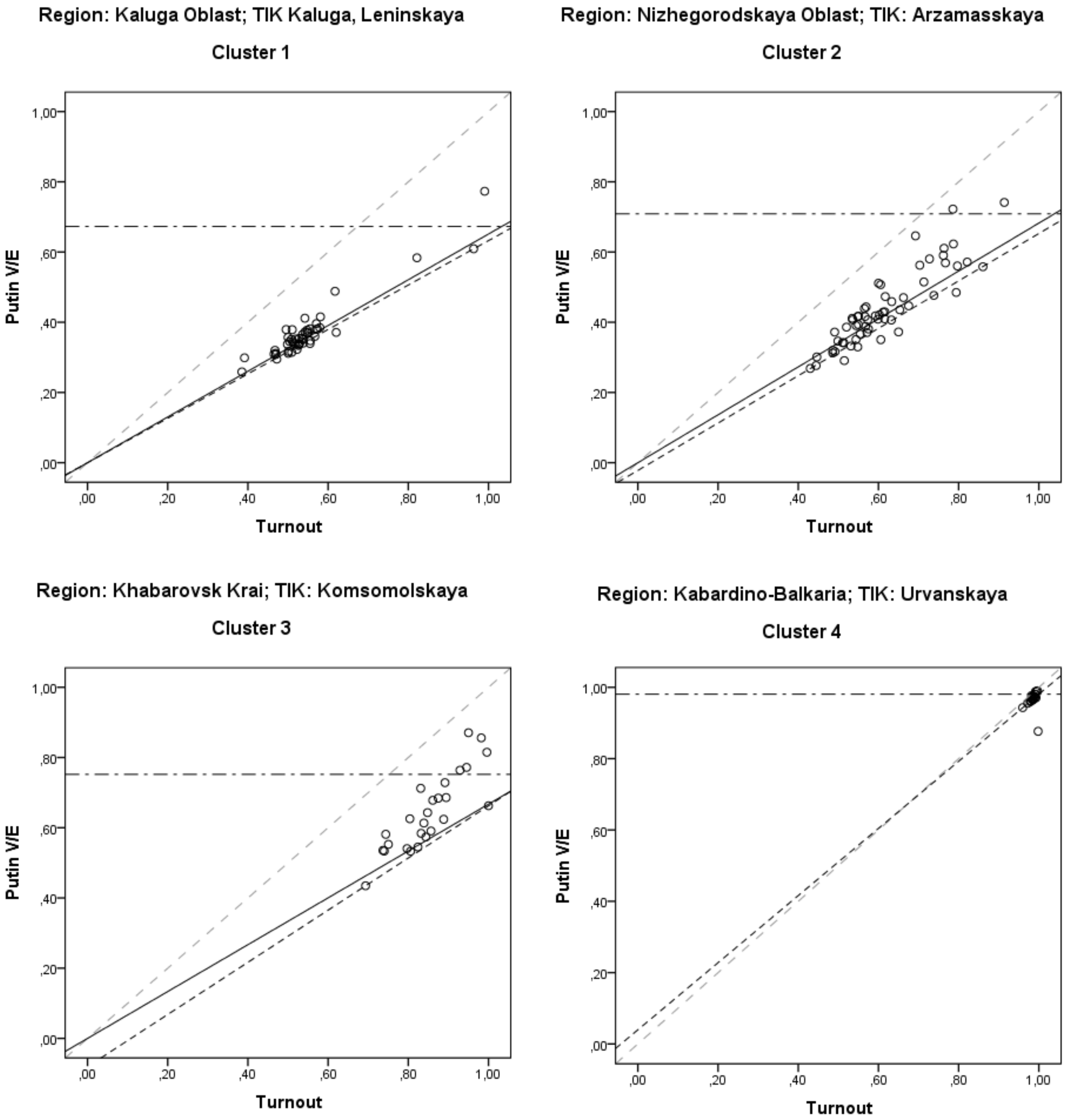
See Figure 4.3 for the typical “fingerprints” of fraud in 2012.

Figure D12. Four typical “fingerprints” of fraud: The most empirically representative TIKs by cluster, 2008



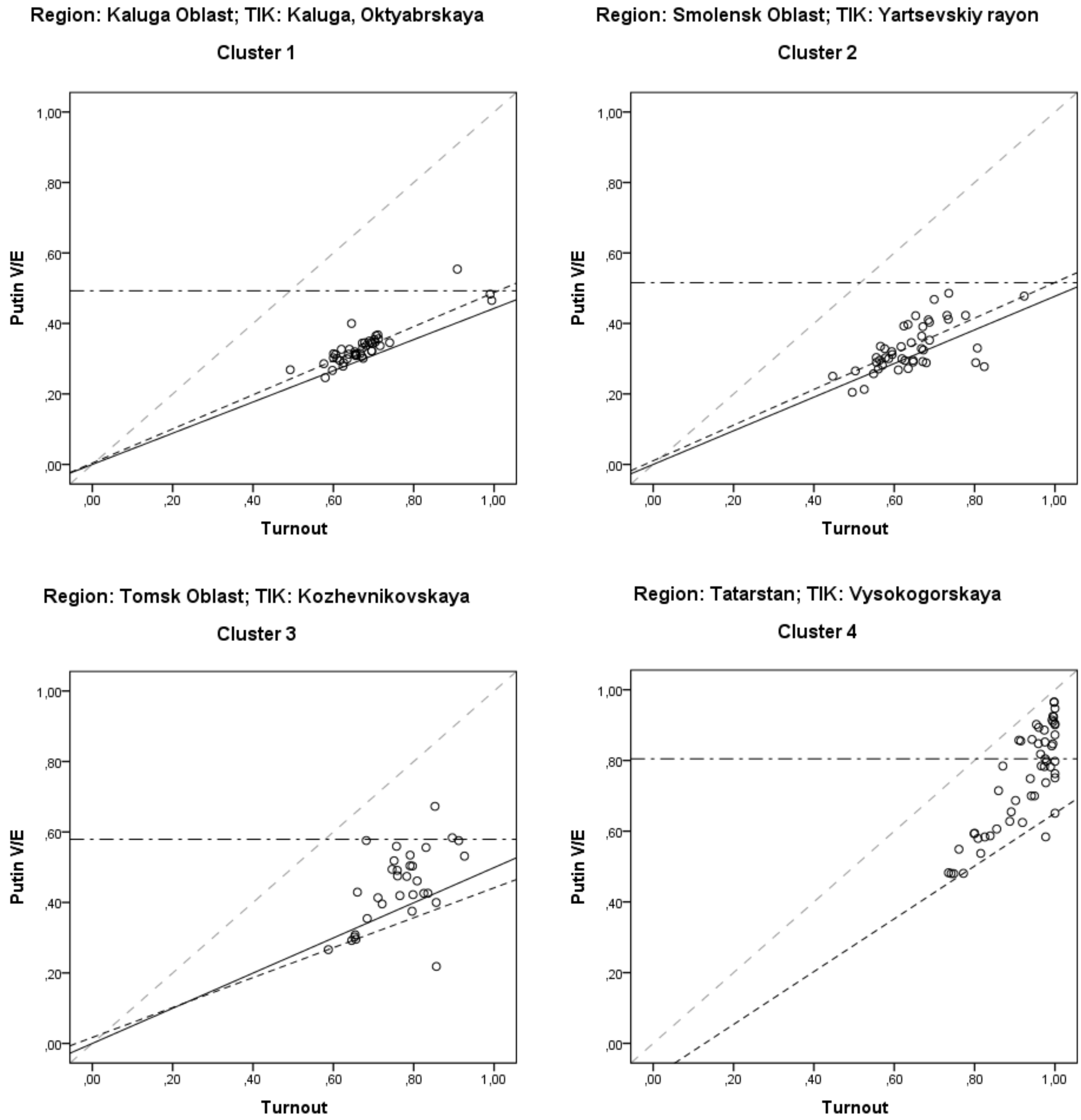
Note: Horizontal dot-dash lines indicate the mean ordinary share of incumbent’s vote (V_i^I/V_i). Dashed lines depict the QR estimate. Solid lines represent the adjusted QR estimate.

Figure D13. Four typical "fingerprints" of fraud: The most empirically representative TIKs by cluster, 2004



Note: Horizontal dot-dash lines indicate the mean ordinary share of incumbent's vote (V_i^I/V_i). Dashed lines depict the QR estimate. Solid lines represent the adjusted QR estimate.

Figure D14. Four typical "fingerprints" of fraud: The most empirically representative TIKs by cluster, 2000



Note: Horizontal dot-dash lines indicate the mean ordinary share of incumbent's vote (V_i^I/V_i). Dashed lines depict the QR estimate. Solid lines represent the adjusted QR estimate.

Appendix E. Supplementary Materials to Chapter 5

Appendix E1. Descriptive statistics

Table E1. Descriptive statistics for variables in analysis and auxiliary variables

	5th Percentile	95th Percentile	Mean	Std. Dev.	Corr. With STB[c]
Panel Data, Average Values of 2000–2012[a]					
Incumbent's Vote (%)	54.14	86.23	65.67	9.41	.350**
Budget Type	0	1	.49	.50	.655**
Share of Transfers in the Budget (%)	4.43	71.62	28.17	20.19	1
Share of Transfers in the Budget (%), 2001–2013[b]	7.22	77.23	32.57	19.99	.914**
Log Total Transfers (RUB)	1.04E+10	3.66E+10	2.30E+10	7.37E+09	.287**
Log Total Transfers (RUB), 2001–2013[b]	1.66E+10	4.46E+10	2.95E+10	8.23E+09	.202**
Log Total Transfers Per Capita (RUB)	13343.55	45838.43	29003.47	9215.95	.552**
Log Total Transfers Per Capita (RUB), 2001–2013[b]	23112.40	52401.97	36006.07	8650.28	.512**
Log Regional Taxes Per Capita Inflation Adjusted (RUB)	49245.12	116361.06	78954.53	19174.78	-.630**
Log Regional Taxes Inflation Adjusted (RUB)	4.31E+10	1.99E+11	1.24E+11	4.35E+10	-.728**
Terrorist Attacks	0	1	.14	.35	.143**
Conflict Situation	0	1	.15	.36	.304**
Years Last Governor in Office	0.05	14.36	6.63	4.56	.038
Log GRP (RUB)	1.30E+11	1.17E+12	7.01E+11	2.89E+11	-.480**
Log GRP Per Capita (RUB)	214685.37	375652.67	283236.86	49859.36	-.341**
Log Population	742840.8	3745626.8	2329588.8	862981.9	-.487**
Log Unemployment (%)	8.86	19.21	13.27	2.68	.217**
Pop. With Income Below the Living Minimum (%)	13.00	40.40	24.26	8.41	.223**
Infrastructure is More Developed	-1.64	1.50	0.00	1.00	-.228**
Infrastructure in Worse Condition	-1.58	1.80	0.00	1.00	.114*
Time-Invariant or Variables of 2012[d]					
Declared Sovereignty in the Early 1990s	0	1	.31	.47	.492**
Republican Status	0	1	.25	.44	.562**
Media Persecution Index	3.93	76.97	29.48	29.03	.182
Mean N of Years Governor in Office	3.61	15.80	7.96	3.73	-.041
N of Governors Since 2004	1	4	2.28	.85	-.039
MPs Biographically Adjusted	0	14.28	3.98	3.95	-.300**
MPs Biogr-lly Adj. Per 1 Mln. Pop.	0	4.05	2.21	1.11	.101
Non-Russians (%)	3.0	92.0	23.06	25.77	.42**
Non-Orthodox Christians (%)	3.0	58.0	13.98	16.31	.422**
Ethnoreligion Index	30.39	94.66	59.43	19.69	.427**
Variables of Changes, Average Values of 2000–2012[e]					
All Ranked Variables	4.50	79.80	42.00	24.01	n/a
Incumbent's Vote Change	-12.22	24.99	3.56	12.2	n/a
Regional Taxes Percent Change	-12.91	75.21	22.94	27.41	n/a
Infr. More Developed Change	-.59	.57	.00	.35	n/a
Infr. in Worse Condition Change	-.78	1.2	.00	.55	n/a

Note: a. All statistics are based on the pooled CSTS data. The average between-year statistics are presented, that is, each statistic is firstly calculated for each year of 2000, 2004, 2008, and 2012 and then averaged between the years. b. Additionally specified for 2001, 2005, 2009, 2013. c. Correlations with the pooled STB 2000, 2004, 2008, 2012 calculated based on log-transformed variables where necessary (see Appendix E8). Other statistics based on non-transformed variables. d. Correlations for time-invariant variables presented with the STB 2012. e. Statistics for the variables of changes is also based on the pooled CSTS data of years 2000–2004, 2004–2008, and 2008–2012. Significant at: *p < 0.05, **p < 0.01 (2-tailed).

Appendix E2. Alternative measures and explanations

Table E2. OLS models explaining the allocation of transfers of various types, 2013

Dependent Variable:	Donations (Total)	Donations Leveling	Donations Balance	Subsidies	Subventions
Share of Total Transfers:	40.1%	27.6%	11.7%	34.4%	18.2%
Constant	-1.5e+10 (-1.04)	5.6e+9 (.37)	-5.5e+9 (-.90)	5.3e+9 (1.13)	3.5e+9 (1.30)
Log Population	3249.3** (2.32)	2563.1 (1.67)	1487.0* (2.43)	1516.5** (3.23)	1654.1*** (6.18)
Log Regional Taxes (RUB)	-.01 (-.38)	-.051* (-1.84)	.018 (1.61)	-.003 (-.31)	-.003 (-.56)
Log GRP (RUB)	-.002 (-.76)	6.9e-4 (.21)	-.003* (-1.93)	-6.0e-4 (-.60)	5.4e-4 (.95)
Log Unemployment (%)	7.0e+8 (1.00)	1.0e+09 (1.32)	5.1e+8 (1.67)	-4.0e+7 (-.17)	-2.0e+8 (-1.45)
Population with Income Below the Living Minimum (%)	8.8e+8** (2.62)	1.1e+9*** (2.87)	6.4+7 (.44)	8.1e+7 (.72)	4.4e+7 (.68)
Infrastructure Is More Developed	5.0e+9* (2.40)	4.3e+9 (1.91)	1.9e+9** (2.13)	3.6e+8 (.51)	2.0e+8 (.51)
Infrastructure Is in Worse Condition	-2.9e+9 (-1.55)	-2.1e+9 (-1.03)	-6.6e+7 (-.08)	-2.3e+9*** (-3.70)	1.5e+8 (.43)
Putin's Vote (%), 2012	2.8e+8* (1.88)	4.1e+6 (.03)	1.1+8* (1.75)	2.3e+7 (.47)	-3.3e+7 (-1.19)
Declared Sovereignty in the Early 1990s	-6.6e+7 (-.02)	7.2e+7 (.02)	-9.9e+8 (-.81)	-3.4e+8 (-.36)	6.6e+8 (1.23)
Terrorist Attacks 2009–2012 [Attacked]	4.5e+9 (1.45)	3.6e+9 (1.07)	1.5e+9 (1.15)	-4.5e+8 (-.44)	-3.5e+8 (-.59)
Log Media Persecution Index 2007–2012	-2.8e+7 (-.78)	-3.3e+7 (-.84)	-3.5e+7** (-2.27)	-9.0e+8 (-.77)	9.4e+6 (1.40)
Log Years Governor in Office up to 2012	1.1e+8 (.57)	1.3e+8 (.63)	1.2e+7 (.14)	6.8e+7 (1.06)	2.8e+7 (.77)
Log N of MPs	4.8e+8 (.91)	6.7e+8 (1.15)	1.9e+8 (.82)	2.2e+8 (1.24)	1.3e+7 (.13)
R-squared	.500	.580	.445	.622	.878
N	83	83	83	83	83

Note: Entries are unstandardized coefficients with t-values in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The money being remitted from the federal center to regions generally include unconditional donations of two types (donations for leveling regional budgets and donations for providing budgetary balance), and two earmarked grants: subsidies and subventions, the latter is targeted at financing responsibilities delegated from the center to regions.[179] Table E2 examines determinants of allocation of these transfer types. Among the politically neutral variables, none has an effect in all models. The amount of regional taxes is significant in the Donations Leveling model while GRP is significant in the Donations Balance model yet none of them is significant in the model of total donations. Putin's vote is expectedly significant in the models of non-earmarked transfers. One may wonder, however, why the incumbent's vote is significant at all if all types of transfers presented in the table are based on various formulas. Grossman (1994: 302) answers to this question by postulating that "[f]ormulae are set by politicians not by apolitical, benevolent outsiders and as such political considerations may influence the formulas' determination". Likewise, Levitt and Snyder (1995) found empirical evidence that the U.S. federal outlays distributed with formulas were even more heavily biased toward Democratic voters than non-formula programs. Nor did formula-based transfers eliminate politically motivated targeting in Ghana (Banful 2011). Generally, none of the transfer types has demonstrated a better performance than the total amount of transfers, which is used in the main text. Apparently, this is some critical mass or the total amount of transfers that makes sense. It should be also noted that, as follows from Table E3, the transfer types differ markedly from each other and from the total transfers having rarely more than 40% of the common variance.

Table E3. The correlation matrix of total transfers and their components

	Transfers (Total)	Donations (Total)	Donations Leveling	Donations Balance	Subsidies	Subventions
Transfers (Total)	1	.526**	.239*	.525**	.733**	.668**
Donations (Total)	.526**	1	.803**	.574**	.319**	.048
Donations Leveling	.239*	.803**	1	.089	.108	-.235*
Donations Balance	.525**	.574**	.089	1	.509**	.473**
Subsidies	.733**	.319**	.108	.509**	1	.645**
Subventions	.668**	.048	-.235*	.473**	.645**	1

Note: Entries are Pearson Correlation coefficients. Significant at: *p < 0.05, **p < 0.01.

[179] There are several minor gratuitous receipts to regional budgets that not mentioned here.

Table E4. Testing various measurements of the political concerns' variables, 2013

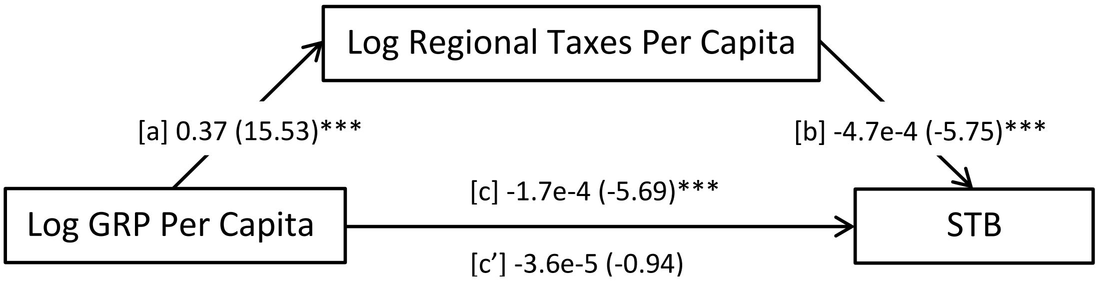
Dependent Variable:	STB		Log Transfers Per Capita (RUB)		Log Transfers (RUB)	
	Full Model	Best Model	Full Model	Best Model	Full Model	Best Model
Constant	-2.592 (-.11)	12.37 (.86)	-6059.1 (-.19)	33564.8** (2.51)	1.2e+10 (.57)	-1.42e+8 (-.02)
Log Population					5009.1*** (2.92)	4786.7*** (3.50)
Log Regional Taxes Per Capita[a]	-3.4e-5 (-.51)		.105 (1.12)		-.023 (-.79)	
Log GRP Per Capita[a]	-1.5e-5* (-1.75)	-1.8e-5*** (-6.46)	-.014 (-1.14)		.002 (.63)	
Putin's Vote (%), 2012	.717*** (3.74)	.704*** (4.66)	1009.4*** (3.69)	845.7*** (4.16)	2.75e+8 (1.64)	3.9e+8*** (3.49)
Terrorist Attacks 2009–2012 [Attacked]	8.352 (1.48)		9172.1 (1.14)		1.5e+8 (.03)	
Terrorist Threat 1997–2012 [Attacked]	-9.651* (-1.68)		-1.7+4** (-2.08)		1.35e+9 (.27)	
Press Freedom 2010	1.102 (.44)		1987.7 (.55)		-4.6e+8 (-.22)	
Log Media Persecution Index 2007–2012	.120** (2.44)	.131*** (2.86)	98.68 (1.40)		-1.16e+6 (-.03)	
Log Mean N of Years Governor in Office	.0719 (.13)	.559** (2.20)	-512.3 (-.64)	-1045.3** (-2.02)	-2.7e+8 (-.61)	
N of Governors Since 2004	2.609 (.92)		2312.6 (.57)		7.8e+6 (.00)	
Log Years Governor in Office up to 2012	.747** (2.39)		1161.7** (2.60)	968.6** (2.50)	1.12e+8 (.42)	
Log MPs Adjusted Per 1 mln. pop.[a]	-2.657 (-1.40)	-3.081** (-2.39)	-4048.2 (-1.49)	-5392*** (-2.91)	1.25e+9 (1.65)	1.5e+9** (2.60)
Log United Russia's MPs Adjusted Per 1 mln. pop.[a]	.483 (.99)		698.9 (1.01)		-2.4e+9*** (-2.66)	-2.4e+9*** (-3.17)
Log MPs non-Adjusted Per 1 mln. pop.[a]	-.567 (-.25)		-196.7 (-.60)		5.47e+8 (.71)	
R-squared	.642	.806	.351	.273	.553	.535
White heteroscedasticity test	.477	.61	.553	.704	n/a	n/a
N	83	83	83	83	83	83

Note: Entries are unstandardized coefficients with t-values indicated in parentheses. a. For models with Log Transfers explanatory variables present in their units of measurement without dividing by population, the variable of population is included instead. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Appendix E3. The mediation effect of regional taxes on GRP in determining the STB

Besides the fact that the regional tax revenue and the regional gross added value are highly correlated there is another reason to forgo including these variables in the equation as predictors of the central transfers simultaneously, namely, the causal relationship between variables, which follows from GRP to regional taxes and then to transfers. Figure A1 depicts this mediation effect.

Figure A1. The mediation effect of regional taxes on the relationship between GRP and the STB



Note: Entries indicate coefficients with t-values in parentheses. [a], [b], and [c] are bivariate multilevel regression models while [c’] includes both Log GRP Per Capita and Log Regional Taxes Per Capita as predictors; the dependent variables are shown by the arrows. The random term consists of the intercepts and coefficients varying by Year and Type, where years include 2000, 2004, 2008, and 2012. Models fit by maximizing penalized quasi-likelihood (PQL) with general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. ***p < 0.01

There is evidently no direct effect of GRP on transfers. The explanatory power of the bivariate models with regional taxes and GRP is very similar: [b] and [c] explain respectively 63.7 and 62.4 percent of the STB’s variance, respectively. However, once the variable of regional taxes is controlled for, the explanatory capacity of GRP falls dramatically up to statistical insignificance. Compared to [c], entering GRP in the equation [c’] improves the model only slightly: the explanatory power increases by two percent and becomes equal to 64.6%. The effect of regional taxes is also suppressed but not so strongly (-3.7e-4) and it remains significant (t-value = -2.88).[180] The decrease in significance of both variables comes from the fact that GRP and regional taxes are highly correlated (R^2 [a] = 0.911). These conditions met the classical requirements for mediation (Baron and Kenny 1986), namely, that [a], [b], [c] are significant, the mediator is significant in [c’], and that the predictor’s effect decreases greatly in [c’]. Moreover, the causal direction of mediation is quite obvious: regional taxes are collected based on the size of regional economies and the federal decisions to allocate transfers are determined by the levels of sufficiency of regional revenues. The Sobel test also indicates that the moderation effect of regional taxes on transfers is statistically significant (z-value = 2.83, p-value = 0.0046).[181]

[180] Full models’ parameters are not shown.

[181] Sobel test equation: $z = (a * b)/\sqrt{b^2 * s_a^2 + a^2 * s_b^2}$, where a is the predictor’s coefficient for [a], b is the mediator’s coefficient for [c’], s_a and s_b denote standard errors of a and b.

Appendix E4. Declarations of state sovereignty being explained by ethno-religious concerns and by the set of alternative explanations

Table E5. Who declared sovereignty in the early 1990s: Logistic regression models

Dependent Variable:	Declared Sovereignty				
Predictors' year:	2012	2008	2004	2000	Reduced Model
Constant	1.6e-9** (-1.97)	5.9e-8*** (-2.82)	.000** (-2.15)	5.5e-6** (-2.39)	.011*** (-4.95)
Non-Russians (%)	1.35* (1.86)	1.29** (2.27)	1.25** (2.42)	1.25*** (2.65)	1.19*** (4.33)
Non-Orthodox Christians (%)	1.01 (.05)	.965 (-.26)	1.05 (.42)	1.04 (.38)	
Extraction of Natural Resources Per Capita (RUB)	.999 (-1.05)	.999 (-1.31)			
GRP Per Capita (RUB)	1.00 (1.11)	1.00 (1.49)	1.00 (.49)	1.00 (.24)	
Unemployment (%)	1.78 (.88)	1.52 (1.3)	1.52 (1.27)	1.52 (1.52)	
Pop. With Income Below the Living Minimum (%)	1.48 (1.61)	1.33* (1.73)	1.04 (.56)	1.02 (.2)	
Infrastructure Is More Developed	3.87* (1.7)	3.15 (1.26)	10.45* (1.84)	6.51* (1.86)	
Infrastructure Is in Worse Condition	.457 (-1.06)	.828 (-.31)	.277* (-1.71)	.336 (-1.58)	
Terrorist Attacks 1997–2012 [Attacked]	9.6e-6 (-1.27)	.001 (-1.43)	.002 (-.26)	.001 (-.25)	
Media Persecution Index	1.02 (.41)				
Population	1.00 (1.05)	1 (.075)	1 (.58)	1 (.79)	
Pseudo R-squared	.761	.747	.726	.738	.646
N	83	83	83	83	83

Note: Entries are odds ratios with t-values in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Table E5 aims to explain what kind of regions declared sovereignty by the end of 1991. Since this question is of auxiliary character in this analysis I use the available set of variables without collecting that-time data. It, of course, leads to some degree of imprecision but I assume that, first, several especially economic variables are very inertial and, second, the relationship between explanatory and the outcome variables should be stronger as time is getting closer to the early 1990s. Due to this reason the table presents the models for various years. The results of logistic regression show that only two variables – the share of non-Russian population and the level of development of regional infrastructure – can explain the adoption of sovereignty declarations in a systematic manner.[182] Infrastructure development appears to be significant in all but 2008 years while the share of non-Russians is significant in models of all years and its significance

[182] Since there are no strict assumptions on linearity in logistic regression I do not use log-transformed variables. Log-transformation however produces very similar results to those presented in the table.

increases from 2012 through 2000, as indicated by t-values. However, only the percentage of non-Russians is significant enough to be included in the best model.[183] As follows from the reduced model, the proportion of non-Russian population explains over sixty percent of the maximized likelihood of declaring sovereignty. If the proportion of non-Russians shifts from the 5th percentile (3% or the level of Ivanovo Oblast) to the 95th percentile (92% or the level of Dagestan) the probability of sovereignty declaration correspondingly increases from 1.8 to 99.9 percent.

It is worth mentioning that in his other work Treisman (1997) admits that ethnic and religious concerns played a major role in determining regional propensity to separatist activism. He especially underlines that "[t]he Muslim/non-Muslim boundary was more influential than other cultural or linguistic divisions" (p. 243). Therefore, sovereignty declarations should be rather deemed as a mediator variable between primordial ethno-religious characteristics and central transfers.

Appendix E5. The effects of electoral interests versus ethno-religious concerns on the allocation of transfers

Table E6. OLS models testing electoral interests versus ethno-religious concerns to determining the allocation of transfers in various years by budget type

DV: STB	2001		2005		2009		2013	
	FM	BM	FM	BM	FM	BM	FM	BM
Recipients								
Constant	-37.79 (-1.24)	-46.7*** (-2.98)	-14.41 (-.56)	14.28 (.8)	-6.8 (-.37)	-9.18 (-.52)	-10.0 (-.45)	11.64 (.93)
Incumbent's Vote	-.293 (-1.3)		.233 (1.06)		.423** (2.3)	.48*** (3.04)	.337 (1.41)	
Log Ethnoreligion Index	.254 (1.33)		.303* (1.86)	.449*** (3.55)	.061 (.66)		.335** (2.24)	.448*** (4.17)
Log Regional Taxes Per Capita	-4.2e-5 (-.26)		-2.2e-4 (-1.37)	-3.4e-4** (2.66)	-2.4e-4** (-2.55)	-2.3e-4** (2.58)	-2.5e-4* (2.0)	-3e-4*** (-2.98)
Log Unemployment (%)	3.05* (2.06)	3.3*** (3.56)	1.73* (2.03)	1.38* (1.84	2.12*** (3.05)	2.23*** (3.54)	.262 (.15)	
Population With Income Below the Living Minimum (%)	.616*** (3.48)	.633*** (4.03)	.234 (1.25)		.756** (2.65)	.77*** (2.74)	1.41*** (2.89)	
Infrastructure Is More Developed	2.56 (.93)		.807 (.4)		.53 (.42)		.48 (.22)	
Infrastructure Is in Worse Condition	3.89* (1.94)		3.11* (1.97)	3.3** (2.15)	1.19* (1.85)	2.3* (1.99)	-1.4 (-.81)	
R-squared	.817	.754	.793	.774	.743	.74	.69	672
White test	.406	.787	.703	.253	.265	.138	.28	.055
N	25	25	38	38	63	63	47	47
Donors								
Constant	-2.31 (-.13)	5.53 (.44)	7.61 (.5)	28.8*** (2.96)	66.32* (1.82)	.543 (.09)	6.34 (.39)	18.05** (2.5)
Incumbent's Vote	-.059 (-.56)		.11 (.74)		-.624* (-2.01)		.176 (1.08)	
Log Ethnoreligion Index	.157* (1.92)	.169** (2.19)	.032 (.48)		.349* (2.06)		-.074 (-.97)	
Log Regional Taxes Per	-2.3e-	-2.5e-	-2.8e-	-2.9e-	-2.8e-4*		-9.7e-5	-1.4e-

[183] Based on significance level > 0.10, the variable of ethnicity was the only one in the best models of years 2004, 2008, and 2012. Unemployment and the index of infrastructure development were additionally included in the model of 2000. Therefore, I call the best model "the reduced model".

Capita	4** (-2.32)	4** (-2.69)	4*** (-3.51)	4*** (3.92)	(-2.13)		(-1.3)	4** (-2.48)
Log Unemployment (%)	.846 (1.34)		.658 (1.56)		1.6* (1.9)	2.04*** (3.42)	1.21* (1.8)	1.25** (2.19)
Population With Income Below the Living Minimum (%)	.68*** (4.25)	.75*** (5.33)	.592*** (2.9)	.548*** (2.86)	-1.04 (-1.42)		.174 (.36)	
Infrastructure Is More Developed	.641 (.29)		.755 (.54)		6.94*** (3.39)	7.73*** (3.46)	1.8 (1.43)	
Infrastructure Is in Worse Condition	.291 (.19)		-1.64 (-1.46)		-3.0 (-1.43)		.021 (.02)	
R-squared	.667	.648	.649	.607	.739	.567	.375	.294
White test	.81	.951	.499	.892	.395	.927	.422	.004
N	58	.58	45	45	20	20	36	36

Note: Entries are unstandardized coefficients with t-values in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Ethno-religious concerns in allocation of transfers are tested against electoral interests and the set of alternative explanations in Table E6. For this purpose, I construct an index that combines two variables of ethnicity and religion, and the interaction between them in such manner that it would better explain the share of transfers in regional budgets.[184] For doing this I run thirteen regression models for years 2000, 2001,... 2012 with the STB as the dependent variable, the predictors include log-transformed centered percentage of non-Russians, non-Orthodox Christians, and the interaction between them.[185] The averaged unstandardized b-coefficients are used then to define the index so that:[186]

$$Ethnoreligion\ Index = 0.174 \times LogNonRussinans + 0.334 \times LogNonOrthodox + 0.015 \times Interaction$$

The results of the regression models are mixed. The incumbent's vote and the Ethnoreligion index are never significant together. Significance of one variable implies absolute insignificance of the other if two variables are in the equation together though each of two is significant if it is included in the model without the other.[187] This could indicate a mediation effect but this is unclear what mediates what since electoral interests and ethno-religious concerns change their places in

[184] I do not use factor analysis for constructing the index since the purpose is not defining the commonality between the variables but giving these three variables a more equal chance in regression analysis. In other words, one variable is supposed to explain the same variance of transfers that is explained by three.

[185] The variables are centered since I am interested in the effects at their mean levels but not at zero level. In the second case both effects are negative (see Figure 4 for the conditional effect of non-Russians).
In the result of centring by subtracting the means of independent variables the coefficient of X or Z can be interpreted as the effect of that variable on Y at the mean level of the other independent variable while a non-centered variable indicate the effect of that variable on Y when the value of the other independent variable is zero

[186] The variables are *not* centered at this stage since centring creates negative values that provide misleading index's values: when value of one of two centered variables is less the mean and it has negative sign the interaction term is negative, in other cases it is positive though; when values of the centered variables are negative then they are subtracted from the value of interaction term, when they are positive they are summed to it.

[187] The Ethnoreligion index is significant in the analogous models without the incumbent's vote for the recipients in the years 2005, 2009, and 2013; models are not shown. Significance of the incumbent's vote without the index of Ethnoreligion follows from the main analysis.

various years: the incumbent's vote is significant in 2009 while the Ethnoreligion index is significant in 2005 and 2013. Neither the Ethnoreligion index nor the incumbent's vote is significant in the recipients' model of 2000 though the Ethnoreligion index is significant in the donors' model of 2000 – the only one significant coefficient of the two variables among the recipients. I also tried running analogous models with transfers per capita and raw transfers controlled by population as the dependent variables among the recipients. The variables were again mutually exclusive. In the first case the Ethnoreligion index was significant for years 2001 and 2013; the incumbent's vote prevailed in the other two election years. In the second case the Ethnoreligion index was significant only for year 2001; the incumbent's vote outperformed it in all other years. Thus, based on these results we cannot conclude whether electoral interests or ethno-religious concerns predominate in the allocation of transfers. At the same time, we cannot discard any of them. It is rather a mediation effect of ethnicity and religion on the vote in determining transfers accompanied with the main effect of ethno-religious concerns on transfers.[188]

However, it is difficult to disentangle whether the positive effect of the Ethnoreligion index on the allocation of transfers is associated with appeasement or rewarding strategy. It may be interpreted on both sides: ethnically and religiously divergent regions may be perceived as more rebellious by the Kremlin, they may, however, be considered as members of the ruling coalition either so long as the regime draws the bulk of its electoral support from these regions. In fact, the incumbent's vote is quite well predicted by the share of non-Russian and non-Christian Orthodox population, and the interaction between them: 54%, 53%, and 61% of the variance is explained for elections of years 2004, 2008, and 2012, respectively.[189] At any rate, it might be reasonably asserted that appeasement strategy prevails if a positive association between the ethno-religious concerns and central transfers has been accompanied with a *negative* relationship between the incumbent's vote and the transfers. Since this is not the case, non-Russian and non-Orthodox Christian regions were rewarded rather than appeased under the Putin's rule.

[188] It would be a clear mediation effect of ethno-religious composition on the vote in determining transfers if *only* the incumbent's vote had been significant in the models with the Ethnoreligion index while the Ethnoreligion index is significant in the models without the incumbent's vote. The causal association in such case is twofold: ethnicity and religion firstly determine the vote and then the vote determines transfers. See more on mediation effects in Appendix E3.

[189] 40%, 36%, and 40% is explained solely by the Ethnoreligion Index in the respective election years. The explained proportion of variance is much smaller for the election of 2000 – 8% is predicted by the Ethnoreligion Index and 16% by the variables of ethnicity and religion, and the interaction term: the Russians firstly trusted and voted for Putin while the ethnic republics partially were still rebellious since the 1990s.

Appendix E6. Random effects of the best multilevel models in Table 5.4 and postestimation

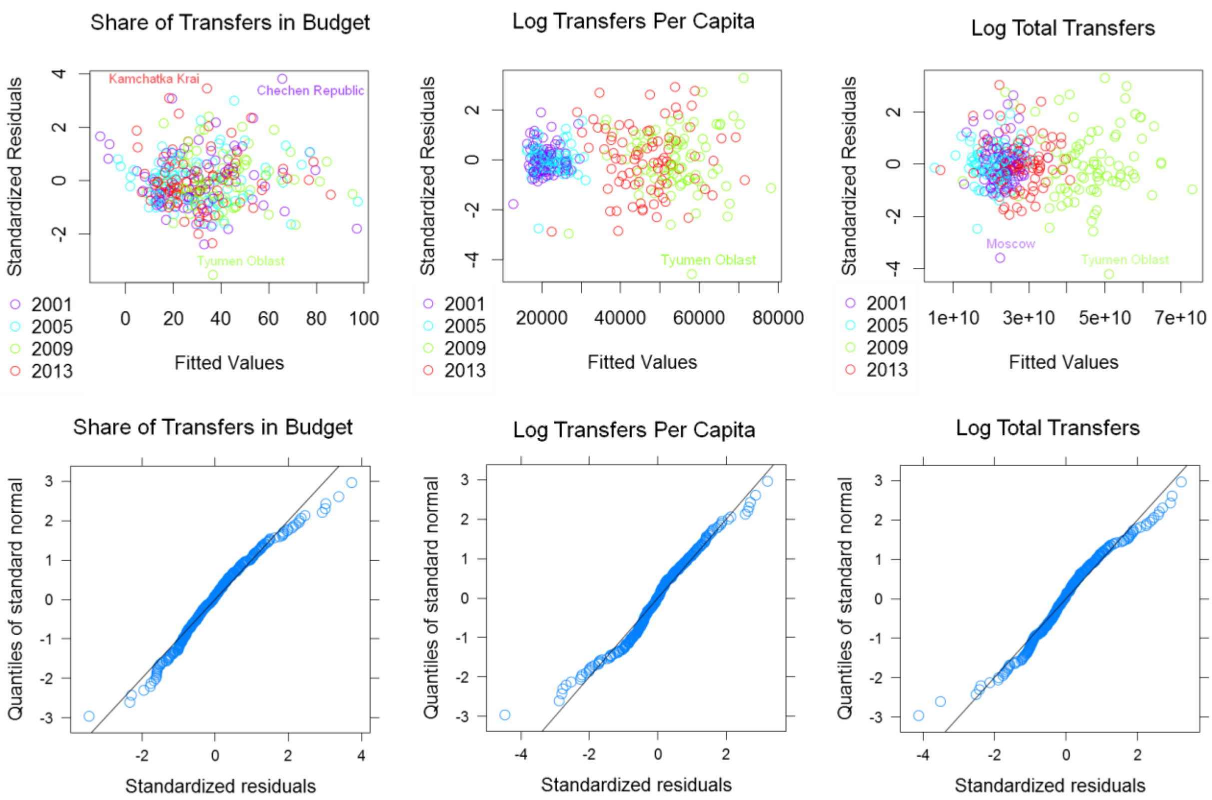
Table E7. The random effects of the best multilevel models presented in Table 5.4

	2001/D	2001/R	2005/D	2005/R	2009/D	2009/R	2013/D	2013/R
Dependent Variable: STB 2001–2013								
(Intercept)	-11.478	-21.681	10.914	-6.9618	18.934	-9.8678	20.185	-27.002
logregtaxpercapita	-.0002	-.0001	-.0003	-.0002	-.0002	-.0002	-.0003	-.0002
logunemployment	1.2676	2.4437	.7280	1.9259	1.9868	1.5959	1.5492	2.2927
belowlivingminimum	.7921	.5778	.4703	.4500	.0228	.9462	.1112	1.0542
incvote	.0146	.0552	.1056	.2442	.1269	.5314	.0602	.6149
conflictsituation	1.8885	-.1857	5.0734	3.3195	3.3092	5.5331	3.5594	4.1894
Dependent Variable: Log Transfers Per Capita 2001–2013 (RUB)								
	2001/D	2001/R	2005/D	2005/R	2009/D	2009/R	2013/D	2013/R
(Intercept)	-140.98	-1816.59	-962.99	-2105.69	-30227	-2573.8	-3200.7	-29887
logregtaxpercapita	.0524	.082	.0664	.099	.2508	.2689	.2758	.3165
logunemployment	729.50	537.14	307.66	381.94	3729.97	1606.56	3299.30	1902.04
belowlivingminimum	108.51	103.53	27.10	136.52	-172.75	722.01	159.64	659.24
infrmoredeveloped	1449.75	1183.64	532.30	898.14	6404.86	1621.38	5155.21	218.64
incvote	-1.87	86.20	6.15	139.18	251.60	432.03	334.19	527.20
Dependent Variable: Log Transfers 2001–2013 (Million RUB)								
	2001/D	2001/R	2005/D	2005/R	2009/D	2009/R	2013/D	2013/R
(Intercept)	-5609.2	-4705.6	-6821.7	-6053.9	-25121	-25004	-12775	-12722
logpopulation	.0045	.0031	.0065	.0035	.0105	.0087	.0067	.0050
logregtaxes	-1.1e-8	5.3e-8	-1.8e-8	5.1e-8	6.2e-8	1.1e-7	3.3e-8	8.5e-8
logunemployment	620.95	547.04	138.13	230.55	605.40	686.15	301.16	440.55
belowlivingminimum	92.39	63.01	134.45	105.33	551.22	547.64	302.79	306.71
incvote	75.49	87.79	103.17	124.30	295.22	305.68	19.09	225.33

Note: D denotes donor regions and R refers to recipients.

The residuals plots in Figure A2 generally indicate no shortcomings of the models presented in Table 5.4. Normal q-q plots at the bottom of the graph show only slight deviation from normality while some degree of heteroscedasticity is visible on the upper scatter plots with Log Transfers Per Capita and Log Transfers as dependent variables; few outliers present among which Tyumen Oblast, which received significantly smaller transfers in 2009 than predicted by each of three models. It should be noted, however, that the residual terms have the multilevel structure that cannot be easily presented by the graphical tools. Marking residuals by various colors depending on panels defined by years partly mitigates this problem. We see from the colored distributions that residuals within groups are much less heterogeneous and distributed closer to normality than the overall distributions (the heterogeneity on two plots to the right follows from the fact that the transfers measured in rubles vary over time whereas the mean of the STB is relatively time-invariant). It must be also pointed out that residuals should be standardized individually to each group of the random term (including the budget type: donors and recipients) therefore a single standardized scale for residuals is not precise.

Figure A2. The residuals plots for the best multilevel models presented in Table 5.4



Several formal tests for normality and heterogeneity of residuals allow us to carry out more detailed diagnostics. The normality can be tested by the Shapiro-Wilk test calculated individually for each group of residuals. Obtaining statistics of the White test of heteroscedasticity is more problematic because the most of software calculates it based on a particular (usually linear) model. To create an analogue of the White test for multilevel analysis, I regress squared residuals obtained from the multilevel model on the multilevel model's predictors using the same syntax on the right-hand side of the multilevel equation. Unlike the White test, I do not include in the model squared and interaction terms due to computational complexity of such a model. The null hypothesis suggests that if heteroscedasticity is absent then none of predictors should correlate with the error term, alternatively, if errors increase or decrease with any independent variable, significance of its coefficient would indicate heteroscedasticity. The chi-squared statistic for the White test is derived from Lagrange multiplier, which is the product of R^2 and the total number of observations.

Table E8. The residuals statistics for the best multilevel models presented in Table 5.4

Dep.Var.	Shapiro-Wilk test of normality[a]								Het. Test[b]
	2001/D	2001/R	2005/D	2005/R	2009/D	2009/R	2013/D	2013/R	
STB	.9458 (.011)**	.9709 (.689)	.971 (.315)	.9475 (.074)*	.9557 (.224)	.9723 (.265)	.8537 (.000)***	.9611 (.105)	.057 (18.9)
Log Transfers P. C.	.9593 (.046)**	.8753 (.007)***	.8195 (.000)***	.9093 (.005)***	.9451 (.114)	.9462 (.021)**	.9762 (.651)	.9868 (.853)	.212 (73)**
Log Transfers	.9342 (.003)***	.9096 (.035)**	.965 (.189)	.976 (.577)	.9571 (.244)	.9764 (.387)	.9759 (.641)	.9653 (.156)	.205 (68)*

Note: D denotes donor regions and R refers to recipients. a. Entries are W-statistics with p-values in parentheses. b. Entries are within-group R^2 of the multilevel model with squared residuals from models in Table 5.4 – on the left-hand side, and with the same set of predictors as on the right-hand side in Table 5.4. R^2 is calculated as follows: $R^2_{yt} = \left(\sum_1^8 \left(1 - \left(\sum_{i=1}^{nyt} \varepsilon^2_{iyt} \,/\, \sum_{i=1}^{nyt}\left(u_{iyt} - \bar{u}_{yt}\right)^2\right)\right) \times n_{yt}\right)/N$, where ε denotes the model's error term, u to the dependent variable, which is the error term of the best model presented in Table 5.4, ū to its mean, all grouped by budget type t nested within year y, whereas n_{yt} is the number of observations in ith region in year y with budget type t, and N refers to the total number of observations; chi-squared statistic with 54 degrees of freedom (the number of model parameters is equal in in all models and includes 48 random and 6 fixed effects) is shown in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The formal tests of Table E8 indicate relatively high reliability of the STB model. The null hypothesis of normality is strongly rejected for donors in 2013; a moderate deviation from normality is detected for donors in 2005 and recipients in 2001. The heteroscedasticity test statistics confirms that residuals are distributed with equal variance. In the multilevel model of regression of the squared residuals on predictors from the same equation only the variable of regional taxes was significant at 0.01 level determining thereby the largest portion of heteroscedasticity. The models with Log Transfers and Log Transfers Per Capita are less trustworthy in this regard. The residual term of Log Transfers model approximates normality fairly well whereas residuals of the Log Transfers Per Capita model strongly deviate from normality in three out of eight groups and minor deviations exist in two groups. The both models, however, barely pass the heteroscedasticity test. The main role in determining heteroscedasticity again belongs to regional taxes; the population (sig. at 0.01) and in a lesser degree the incumbent's vote (sig. at 0.07) also contributed to heteroscedasticity in the Log Transfers model. In each of three models, the variable of regional taxes had a positive coefficient meaning that the error of prediction is larger at high values of regions' own revenues.

Appendix E7. Testing causality between the incumbent's vote and transfers

The Granger (1969) test is frequently applied for examining directions of causal relationships in time-series analysis. The idea behind the Granger causality test is simple: if X causes Y then the past values of X can predict the present values of Y but not the contrary, and that inclusion of X in the model allows significantly improve the prediction of Y compared to the model based only on Y's own past values. This statement mathematically implies the following pair of vector autoregression (VAR) modes:

$$Y_t = \alpha_1 + \sum_{i=1}^{n} \beta_i Y_{t-i} + \sum_{j=1}^{n} \beta_j X_{t-j} + u_1$$

$$X_t = \alpha_2 + \sum_{i=1}^{n} \gamma_i Y_{t-i} + \sum_{j=1}^{n} \gamma_j X_{t-j} + u_2.$$

Table E9 replicates the VAR design based on the panel data. The results of the VAR models indicate a unilateral causal direction from the incumbent's vote to the share of transfers in the budget. The lagged variables of transfers in all models are completely insignificant in determining Putin's vote in 2012.[190] It also appears from the 3 lags full model (FM) that the lags of the Conflict Situation, besides the lags of the dependent variable, predict the Putin's vote in the most systematic way. On average, Putin received 1.8 percent of the vote less in regions affected by conflicts in the previous decade. This finding nonetheless is not confirmed by the full model containing two lags.

Table E9. Granger causality tests

	DV: STB 2012				DV: Putin's Vote 2012			
	3 Lags FM	3 Lags RM	2 Lags FM	2 Lags RM	3 Lags FM	3 Lags RM	2 Lags FM	2 Lags RM
Medvedev's Vote 2008	.298* (2.0)	.425*** (3.31)	.381*** (3.02)	.424*** (3.34)	.643*** (5.3)	.743*** (6.49)	.694*** (6.11)	.751*** (6.49)
Putin's Vote 2004	-.053 (-.33)	-.248* (-1.73)	-.144 (-1.16)	-.233* (-1.99)	.451*** (3.42)	.297** (2.32)	.181 (1.63)	.196* (1.83)
Putin's Vote 2000	-.062 (-.58)	.024 (.26)			-.237*** (-2.75)	-.129 (-1.57)		
STB 2008	.522*** (5.05)	.507*** (5.85)	.468*** (5.36)	.527*** (6.59)	.046 (.55)	.077 (.99)	.027 (.24)	.040 (.55)
STB 2004	.229** (2.43)	.309*** (3.99)	.275*** (3.22)	.314*** (4.21)	-.086 (-1.2)	.041 (.60)	-.007 (-.009)	.045 (.67)
STB 2000	.016 (.023)	.032 (.62)			.043 (.78)	-.052 (-1.11)		
Log Reg. Tax. PC 08	1.9e-4 (.54)		-3.8e-4* (-1.93)		2.6e-4 (.9)		-9.1e-6 (-.05)	
Log Reg. Tax. PC 04	-8e-4 (-1.19)		3.4e-4 (1.66)		-5.1e-4 (-1.02)		-5.7e-6 (-.03)	
Log Reg. Tax. PC 00	5.3e-4* (1.91)				2.1e-4 (.93)			
Unemployment 2008	.296 (.48)		.271 (.47)		.033 (.07)		-.085 (-.16)	
Unemployment 2004	-.260 (-.57)		-.262 (.62)		.781** (2.1)		.575 (1.51)	
Unemployment 2000	-.243 (-.49)				-738 (1.82)			
Below Living Min. 08	.360 (1.48)		.258 (1.14)		-.133 (-.67)		-.224 (-1.12)	
Below Living Min. 04	-.125 (-.65)		-.005 (-.04)		.050 (.32)		.044 (.39)	
Below Living Min. 00	.095 (.98)				.014 (.14)			

[190] I also tried to run analogous VAR models for predicting central transfers and the incumbent's vote in 2008. However, the test has shown no causal effect: the lagged values of the incumbent's vote were insignificant in predicting the STB and the lagged values of the STB failed to predict the incumbent's vote at a statistically significant level.

Table E9. Continued:								
Infr. More Developed 08	-4.01*		-3.86**		-2.43		-1.87	
	(-1.93)		(-2.02)		(-1.44)		(-1.09)	
Infr. More Developed 04	8.16*		5.97***		4.17		.170	
	(1.97)		(2.86)		(1.17)		(.09)	
Infr. More Developed 00	-2.59				-4.2			
	(-.68)				(-1.36)			
Infr. Worse Condition 08	-.763		-1.6		1.48		.836	
	(-.43)		(-1.02)		(1.02)		(.59)	
Infr. Worse Condition 04	.836		1.4		-.373		.103	
	(.41)		(.97)		(-.23)		(.08)	
Infr. Worse Condition 00	-.085				.336			
	(-.46)				(.31)			
Conflict Situation 08	.517		1.2		-5.04**		-3.14	
	(.17)		(.48)		(-2.08)		(-1.39)	
Conflict Situation 04	6.17*		5.04*		7.61***		2.24	
	(1.79)		(1.71)		(2.71)		(.84)	
Conflict Situation 00	-1.03				-4.32***			
	(-.56)				(2.87)			
Constant	-4.36	-7.01	-5.74	-6.64	2.46	-4.32	-2.01	-4.70
	(-.34)	(-1.09)	(-.51)	(-1.05)	(.23)	(-.75)	(-.20)	(-.81)
R-squared	.936	.902	.913	.902	.860	.742	.811	.729
F value[a]	14.6***	3.79**	20.0***	5.71***	18.9***	1.92	18.1***	3.11**
N	83	83	83	83	83	83	83	83

Note: FM denotes full model; RM denotes reduced model. Entries are unstandardized OLS coefficients with t-values in parentheses. a. F test is calculated applying the formula: $F = \frac{(RSS_R - RSS_{UR})/m}{RSS_{UR}/(n-k)}$, where RSS denotes the residual sum of squares of the restricted model (R), which includes only the dependent variable' lags, or of the unrestricted model (UR); m is equal to the number of lagged predictor's terms (3 or 2 depending on the model's specification); k (25, 17, 7 or 5) is the number of parameters estimated in the unrestricted model (including the constant); and n (83) is the number of cases. See also Gujarati (2004: 698). Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

If we consider the models predicting the STB in 2012, the lagged variables of the incumbent's vote, especially Medvedev's vote of 2008, appear to be statistically significant predictors throughout all four models. The average effects of the lagged variables of the incumbent's vote equal to 0.183 (3 lags FM), 0.201 (3 lags RM), 0.231 (2 lags FM), and 0.191 (2 lags RM). Hence if we traveled in 2008 from the region with the 5th-percentile support for the incumbent, which was Ryazan Oblast with 61.7% of Medvedev votes, to the 95th percentile as supportive Karachay-Cherkessia with 90.6% of the vote then using our four models we could predict the future difference between these regions in the STB of 2012 equals 5.3, 5.8, 6.8, and 5.5 percent, respectively.

Alternatively, if we keep the past vote of 2004 and 2000 at a constant level and use only Medvedev's vote, which is the most significant, the shift between nearly the least and nearly the most electorally supportive regions in 2008 would predict the difference in the STB in 2012 by, respectively, 8.9, 12.7, 11.4, and 12.6 percent. Surprisingly, the lagged values of per capita regional taxes are rather not causally linked with central transfers: there are only two marginally significant effects of different years in the 3 and 2 lags FMs. The index of regional infrastructure development is seemingly a Granger cause of the federal transfers.[191] The average

[191] I ran analogous full and reduced auxiliary VAR models testing whether the past values of the STB allow to predict the infrastructure development in 2012. It turned out that throughout the models all lags of the STB

effect of the lagged infrastructure equals to 4.15 (3 lags FM) and 2.11 (2 lags FM) that yields, respectively, 6.6 and 3.1 percent increase in the STB of 2012 if the index shifts from its 5th percentile to the 95th percentile. *F* values for the Granger test indicate the statistical difference between the restricted models, which include only the dependent variable's lags, and the unrestricted models. The *F* statistics is quite large and therefore non-indicative in the full models since the auxiliary variables contribute to the prediction. Meanwhile the *F* values considerably larger in the reduced models predicting the STB compared to the reduced models of the incumbent's vote. Moreover, the difference between the full and the restricted models is insignificant in the 3 lags RM. Thus, bilateral causality cannot be rejected with absolute certainty. Nevertheless, this is much more likely that the incumbent's vote determines transfers but not vice-versa.

Appendix E8. Zero-Skewness Log-Transformation Commands

Variables having strongly skewed distributions are transformed applying the following algorithm:

1. Zero-skewness log-transformation is applied,
2. Variables are linearly rescaled so that the minimal and the maximal values of the log-transformed variables fit to the 5th and the 95th percentiles of the non-transformed variables.[192]

This procedure comes up with the following transformation commands:

```
5.2752*(-3537.3511+837.3993*ln(TransfersPerCapita00+70.94379000000001))
4.396*(-4355.5160+1224.3111*ln(TransfersPerCapita01+49.3188))
2.6759*(-18506.8462+3232.7115*ln(TransfersPerCapita04+306.3928))
2.243*(-11872.4227+2644.7015*ln(TransfersPerCapita05+128.0516))
1.45*(-24315.6118+6247.9955*ln(TransfersPerCapita08-3633.438))
1.4215*(-37233.4218+8303.1443*ln(TransfersPerCapita09-3982.521))
-51178.4690+10649.9013*ln(TransfersPerCapita12-4221.756)
.9524*(-55946.9356+11652.9354*ln(TransfersPerCapita13-3541.99))
5.2752*(-16117741822.1565+858675065.6683*ln(TotalTransfers00+150000000))
4.396*(-39845942397.7171+209124136.1852*ln(TotalTransfers01+256000000))
3.6634*(-60379585743.5447+3017251951.7645*ln(TotalTransfers02+685000000))
3.2191*(-82922031137.5893+3971662584.8788*ln(TotalTransfers03+1230000000))
2.6759*(-69032559073.3894+3342812856.0715*ln(TotalTransfers04+930000000))
2.243*(-93592109852.1989+4576250863.4568*ln(TotalTransfers05+1010000000))
```

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were insignificant; additionally to the dependent variable's lags only the first lag of unemployment was significantly and negatively associated with the levels of infrastructure development in 2012.

[192] Exceptions are LogGRPperCapitaRescaled00, –04, –08, and –12 the minimal and maximal values of which are equal to the 5th and the 90th percentiles of their corresponding non-transformed variables. The extremely skewed distributions make the 95th percentile an inappropriate benchmark for the relevant upper limit; the 90th percentile is used instead in these four cases. Other exceptions include all variables related to MPs, governors, LogMediaPersecutionIndexRescaled07_12, LogNonRussiansRescaled, LogNonOrthodoxRescaled. Since the distributions of the corresponding non-transformed variables skewed moderately, the minimal and the maximal values of the rescaled variables fit to the minimal and the maximal values of the non-transformed variables. Rescaling of the variables included in the indices of infrastructure development and infrastructure condition is also based on the minimal and maximal values. The minimal and maximal values of the rescaled Ethnoreligion Index set to 0 and 100, respectively.

1.9471*(-119765327683.2840+5811755542.5220*ln(TotalTransfers06+1190000000))
1.7109*(-64760989427.8241+3502107877.1759*ln(TotalTransfers07-2.35e+08))
1.45*(-190940960357.2120+9205173089.7570*ln(TotalTransfers08-1.33e+09))
1.4215*(-270049455745.9110+12943822346.5783*ln(TotalTransfers09-1.44e+09))
1.2448*(-24734731554.1130+1175271768.0237*ln(TotalTransfers10-5.44e+08))
1.074*(-214359347698.5230+10575349863.3527*ln(TotalTransfers11-1.72e+09))
-282112360953.4510+13800982595.5957*ln(TotalTransfers12-2.08e+09)
.9524*(-244641796812.1490+11734367837.3664*ln(TotalTransfers13-1.62e+09))
-139104354406.8510+6859309363.4203*ln(DonationsTotal13+649000000)
-65316346489.4686+3369873467.3647*ln(DonationsLeveling13+262000000)
-1762440916.5047+948759416.5536*ln(DonationsBalance13+122000000)
-99543133691.6706+4897928148.2101*ln(SubsidiesTotal13+910000000)
-31465834509.8321+1636657286.6161*ln(SubventionsTotal13+24600000)
-122864.0192+20643.8839*ln(RegTaxesPerCapita00-243.5918)
-125234.6780+20319.1379*ln(RegTaxesPerCapita04-1395.108)
-144275.7009+22483.5057*ln(RegTaxesPerCapita08-2631.506)
-141833.7568+21129.7366*ln(RegTaxesPerCapita12-3836.19)
-65345641742.3160+32599949906.4029*ln(RegionalTaxes00+256000000)
-736874118927.9750+36081839923.3897*ln(RegionalTaxes04-1.06e+08)
-858261756998.9430+41203272407.2172*ln(RegionalTaxes08-2.45e+08)
-665527984935.1270+3136487963.7619*ln(RegionalTaxes12-3.70e+08)
-181022262631.9980+9920730143.5485*ln(FederalTaxes00+9277237)
-237156649232.4160+12962700768.9200*ln(FederalTaxes04-1.10e+08)
-341156957274.3840+18414395692.3854*ln(FederalTaxes08-1.30e+08)
-374361854303.5620+19954221925.9073*ln(FederalTaxes12+11000000)
-34795.6671+8727.5047*ln(FederalTaxesPerCapita00-157.8858)
-3133.6968+8097.1784*ln(FederalTaxesPerCapita04-408.0263)
-38851.1764+10203.9366*ln(FederalTaxesPerCapita08+5123.894)
-56225.1110+1026.6841*ln(FederalTaxesPerCapita12+16055.42)
-129885.6696+25044.6221*ln(TotalTaxCapita00-687.1442)
-126283.3494+23983.0797*ln(TotalTaxCapita04-2209.851)
-131349.8027+25835.8174*ln(TotalTaxCapita08-3895.092)
-11762.7522+21332.8525*ln(TotalTaxCapita12-5546.043)
-37.1662+4.9366*ln(MediaPersecutionIndex07_12+2.479101)
.8994+6.8150*ln(MeanN_GovernY_inOffice-1.904092)
-1.0229+6.6654*ln(YearsGovernorInOffice+1.165867)
.8418+5.8414*ln(MPsBiogrAdjusted11+.8657951)
-34.0529+13.8426*ln(MPsBiogrAdjustedPerMlnPop11+11.70174)
2.2582+5.3969*ln(MPsUnitedRussiaBiogrAdjusted11+.4829296)
7.9481+4.9840*ln(MPsUnitedRussiaBiogrAdjustedPerMlnPop11-.9613547)
3.6143+3.6198*ln(MPsBiogrNONAdjusted11+.368433)
-.8970+2.8614*ln(MPsBiogrNONAdjustedPerMlnPop11+1.368164)
5.2752*(-656374313465.8480+30390180721.1161*ln(GRP00+101000000)
2.6759*(-1796403789608.9600+80294290746.0577*ln(GRP04-3.07e+08)
1.45*(-4656957692844.1500+201330741277.5900*ln(GRP08-6.19e+09)
-7751133826899.8100+329511067249.2660*ln(GRP12-1.11e+10)
5.2752*(-44824.2576+8661.1954*ln(GRPperCapita2000-5957.626))
2.6759*(-109286.8681+19196.2732*ln(GRPperCapita2004-12669.57))
1.45*(-234482.2933+38001.8152*ln(GRPperCapita2008-43786.16))
-416073.4380+6324.8750*ln(GRPperCapita2012-73987.99)
-15657289.2922+1260597.0462*ln(Population00+249147.9)
-14597268.1573+1186426.4556*ln(Population04+216913.5)
-14052442.1922+1153237.1938*ln(Population08+18778.7)

-13986392.9747+1155361.8728*ln(Population12+168901.4)
2.0041+1.1917*ln(OfficialsInEmployed00-.0774513)
2.9444+1.1768*ln(OfficialsInEmployed04-.5734294)
2.5973+1.8283*ln(OfficialsInEmployed08-.2467711)
2.8771+1.4553*ln(OfficialsInEmployed12-.4288766)
16.5497+9.4960*ln(EmployedInPublic00-24.6222)
9.3859+11.4419*ln(EmployedInPublic04-22.62886)
18.8647+8.9535*ln(EmployedInPublic08-22.53918)
21.6169+6.0432*ln(EmployedInPublic12-22.22315)
.1945+7.6686*ln(Unemployment00-1.545919)
-.2802+7.4182*ln(Unemployment04+.1332896)
-4.4737+7.1501*ln(Unemployment08+1.88121)
-11.1162+8.1864*ln(Unemployment12+4.975686)
.16*(.0000+3.7738*ln(NonOrthodox+.3301965))
11.207+19.17*ln(NonRussians-1.380358)
17.138+15.4399*ln(EthnoreligionIndex+43.73527)
89.507+(-269.0781+73.6491*ln(-ChildrenCover00+124.7545)*-1)
99.786+(-258.3355+72.5776*ln(-ChildrenCover04+129.398)*-1)
97.807+(-176.8359+56.9777*ln(-ChildrenCover08+114.9443)*-1)
100.311+(-156.0689+53.1664*ln(-ChildrenCover12+113.1995)*-1)
-339.8397+87.5312*ln(RoadsCondition00+47.95709)
-29.4183+78.5029*ln(RoadsCondition04+39.72922)
-258.2735+72.6525*ln(RoadsCondition08+33.9613)
-263.5627+72.6271*ln(RoadsCondition12+37.41891)
-716.1825+148.2923*ln(RoadDensity00+124.9443)
-1026.2081+198.7977*ln(RoadDensity04+174.337)
-461.4307+105.5010*ln(RoadDensity08+78.86972)
-1025.6795+201.3148*ln(RoadDensity12+162.7372)
7.6487+7.0515*ln(DilapidHousing00-.042266)
6.4077+6.3022*ln(DilapidHousing04-.1083575)
4.7861+5.2170*ln(DilapidHousing08+.123203)
4.7134+5.3212*ln(DilapidHousing12+.0445887)

Note: Numbers in the final parts of variables' titles indicate years. Transformation commands for the variables associated with transfers additionally include inflation adjustment factors.

Appendix E9. Replication of main results by Marques, Nazrullaeva and Yakovlev (2016) without outliers

The findings of Marques, Nazrullaeva and Yakovlev (2016) are crucially determined by outliers. To show this, Model 1 in Table E10 replicates the main results as they appear in Model 2 in Table 1 of the article.

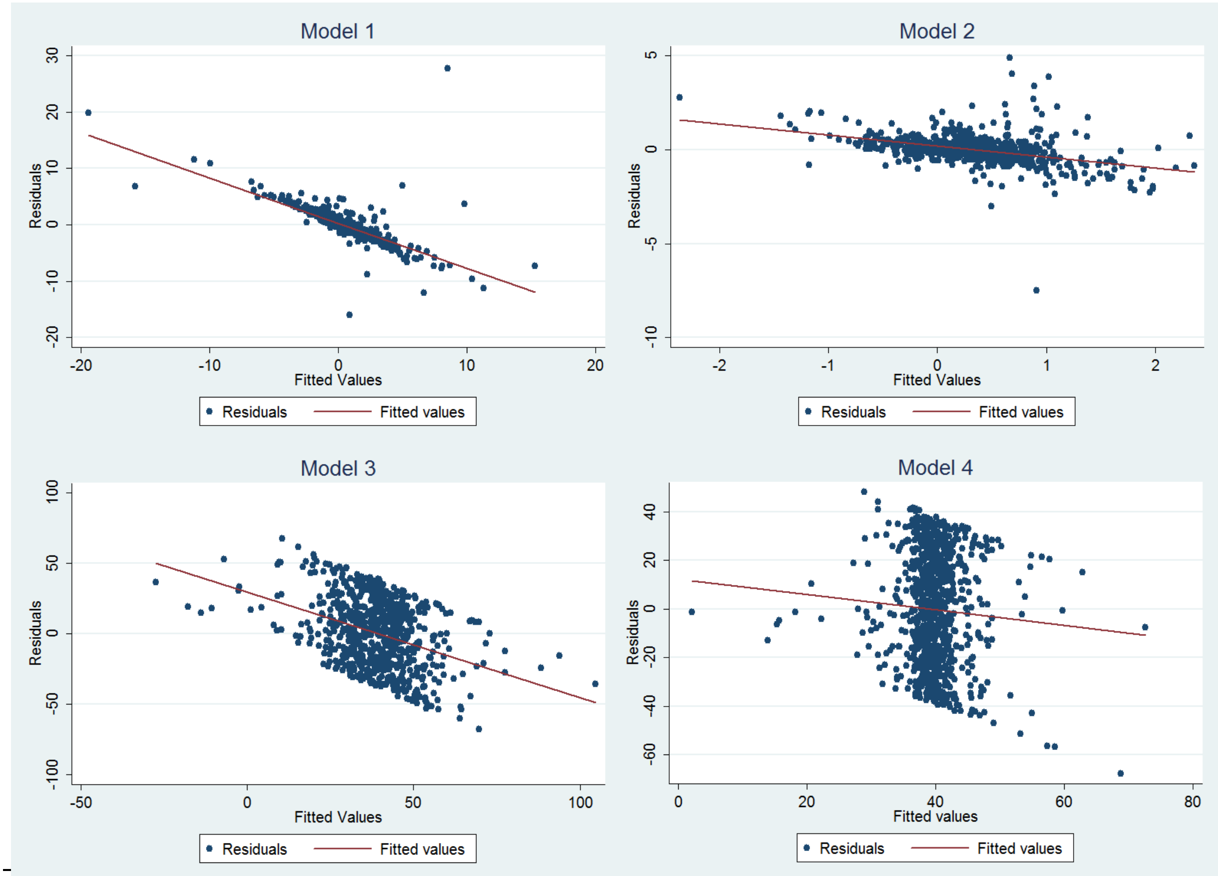
Table E10. Replication of Model 2 in Table 1 by Marques, Nazrullaeva and Yakovlev (2016) with and without outliers

	Model 1[a]	Model 2[b]	Model 3[c]	Model 4[d]
L.GRP Growth Rate	50.95** (2.18)	7.66 (1.04)	121.4 (.65)	21.09 (.6)
L.UR Vote Margin in Duma	20.35*** (3.04)	2.89 (.94)	-.032 (-.17)	.053 (.91)
L.GRP Growth × UR Margin in Duma	-194.7*** (-3.22)	-29.3 (-.8)	-3.26 (-1.15)	-1.15* (-1.67)
L.GRP per capita	-.0067 (-1.61)	-.0002 (-.08)	-.023 (-.45)	-.036 (-1.39)
L. Transfers per capita	.0602*** (2.9)	.064* (1.74)	.451 (1.2)	.317* (1.85)
LD.Ratio of Urbanization	17.8 (.76)	15.6 (1.45)	234.7 (.51)	227.7*** (2.72)
LD.Share of Employed in Public Sector	-.867 (-.76)	-.399 (-.91)	-17.8* (-1.68)	-1.91 (-1.02)
LD.Ratio of Young People to Labor Force	.046 (.97)	-.01 (-.65)	.118 (.32)	-.187 (-1.34)
LD.Ratio of Pensioners to Labor Force	.028 (.48)	-.15 (-.59)	.514 (.97)	.308*** (2.83)
LD.Index of Tax Potential	-.738** (-2.59)	.142 (.83)	-6.84 (-1.18)	-3.48 (-.93)
LD.Index of Budget Expenditures	8.45*** (7.26)	-1.43 (-1.01)	43.3** (2.55)	14.36 (1.53)
Constant	-5.34** (-2.02)	-.767 (-1.11)	33.29** (2.43)	37.88*** (8.9)
Year Effects	Yes	Yes	Yes	Yes
Observations	702	684	702	702
Number of Instruments	51	51	51	n.a.
Heteroscedasticity test[e]	.384	.173	.059	.117

Note: a. Model 1 replicates Model 2 from Table 1 in Marques, Nazrullaeva and Yakovlev (2016: 40). Estimates are obtained by using *xtabond2* command in Stata with the following script: *xtabond2 dtransfpercapita c.l.gdpgrowth##c.l.ur_margin l.grpfixprpercapita l.transfpercapita l.(`exog_controls') i.reg_year if reg_year>=2000&reg_year<=2008, iv(l.tempjanpercapita l.ivcrossterm i.reg_year) gmm(l.transfpercapita l.grpfixprpercapita, lag(3 4)) twostep robust cluster(reg_id)*, where *`exog_controls'* are the differenced variables. b. Model 2 is identical to Model 1 with exception that Chukotka Autonomous Okrug and Magadan Oblast are excluded *(&reg_id!=89&reg_id!=86* is added to *if* filter). c. In Model 3, the dependent variable and United Russia's vote margin are ranked. The interaction is based on the ranked variables. d. Model 4 is OLS regression with the same model specification as Model 3. e. An analogue of White heteroscedasticity test shows R-squared of the OLS model, where the dependent variable is squared residuals from the model in the table and the right-hand side of the equation includes the same set of predictors as in the corresponding model. Data source: israelmarques.com/wp-content/uploads/2015/09/Substituting_Distribution_replication_data_and_codes.rar. T-values are shown in parentheses. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The first lags of GRP growth rate, United Russia's vote margin of 2011, and the interaction between them are significant along with several control variables. However, the authors could have tested the model's validity by looking at its residuals or by using a more formal test for heteroscedasticity of residuals. Figure A3 displays that not only do the residuals of Model 1 contain multiple outliers, but also they strongly correlate with predicted values, indicating thereby a possible non-linearity. Unfortunately, Stata does not report residuals diagnostics for *xtabond2*. I substituted it by an analogue of White heteroscedasticity test. Its R-squared statistic (.384) indicates that the residuals of Model 1 are correlated with the model's predictors, especially with GRP growth (t-value = -5.8), the interaction term (t-value = 7.3), transfers per capita (t-value = 15.7), and the Index of Budget Expenditures (t-value = 6.5); the full regression table is not shown for parsimony. By detecting the most influential residuals, I found that they are associated primarily with two regions. Accordingly, in Model 2, two most influential outliers – Chukotka Autonomous Okrug and Magadan Oblast – are filtered,[193] while the rest of the script remains the same. The difference between Model 1 and Model 2 is huge. Only the lagged variable of transfers per capita is marginally significant. Nevertheless, this minimalist approach filters only the strongest outliers, several other outliers, as follows from Figure A3, are still present in the data, though in Model 2 they are not as influential as in Model 1. More importantly, the heteroscedasticity test (.173) still indicates possible non-linearity.

Figure A3. The residuals of the models from Table E10 plotted against the fitted values



[193] Observations for the cases are filtered for all years, yet it would be sufficient (with a similar result) to filter only statistically strong outliers: Magadan Oblast 2008 and Chukotka 2000–2001, 2004–2008.

In Model 3, the dependent variable is ranked to tackle outliers and United Russia's vote margin is ranked to tackle skewness of its distribution (the rank variable is coded with using also negative values of the vote, which set to 0 in Model 1 and 2). The lagged economic growth, the vote margin, and the interaction between them are again insignificant. Judging from the heteroscedasticity test (R^2 = .059), the residual term of the model improved markedly, yet Figure A3 displays a negative relationship between fitted values and residuals for Model 3. The results of Marques, Nazrullaeva and Yakovlev (2016) also depend on model parameters of *xtabond2*, including the use of instrumental variables and the selection of variables in the GMM option. For instance, in Model 1, the inclusion of all control variables (i.e. *l.(`exog_controls')*) in the GMM option, as it is suggested by Rodman (2006) in most examples,[194] makes the main variables insignificant. The variability of results caused by model specification deserves a separate consideration but it is not discussed here for parsimony.

For more simplicity, Model 4 presents OLS estimates instead of *xtabond2* for the specification of Model 3 (i.e., the dependent variable and United Russia's vote are ranked). The main effects in Model 4 are insignificant; only the interaction term is marginally significant. The lagged differences in urbanization and in the share of pensioners seemingly determine changes in transfers. However, the explanatory power of the model in only 4.4% and these effects are rather spurious. The residual term of the model does not contain outliers, yet regressors still correlate with the errors. Thus, for a proper model selection, distributions of other explanatory variables should be checked for skewness and the analysis should be implemented by year – similarly to the multilevel approach practiced in this dissertation. The latter is not done here as well as other parameters of the models are not discussed (the combination of lags and differences) since the purpose of the appendix is not to build the best model for explaining transfers, this is elaborated in the main text, but rather to show that the results of Marques, Nazrullaeva and Yakovlev (2016) appear as a consequence of violation of basic regression assumptions.

It can be added that everything noted here regarding outliers in the models with differenced dependent variable holds true regarding models of levels presented in Table 2 in the Online Appendix to Marques, Nazrullaeva and Yakovlev (2016): deleting outliers or ranking the corresponding variables makes the main explanatory variables insignificant (the results are not shown for parsimony).

[194] In particular, Rodman (2006: 128) notes: "[*o]rdinarily, put every regressor into the instrument matrix, Z, in some form.* If a regressor, *w*, is strictly exogenous, standard treatment is to insert it as one column (in *xtabond2*, with *ivstyle(w)*). If *w* is predetermined to not be strictly exogenous, standard treatment is to use lags 1 and longer, GMM-style (*gmmstyle(w)*). And if w is endogenous, standard treatment is lags 2 and longer (*gmmstyle(L.w)*)." So, every regressor should be put in *gmm()* or *iv()*. This is a philosophical question to what extent the control variables in the model are endogenous or exogenous. Rodman (2006: 112) uses lagged wages, the firm's capital, and the lagged dependent variable – employment – from Arellano and Bond (1991) data as endogenous variables and concludes that the coefficient on lagged employment improved by moving into the credible range, compared with the situation when wages and the firm's capital are treated as exogenous.

Appendix F. Supplementary Materials to Chapter 6

Appendix F1. Descriptive statistics

Table F1. Descriptive statistics for variables in analysis

	5th Percentile	95th Percentile	Mean	Std. Dev.
Panel Data, Average Values of 2000–2012[a]				
Incumbent's Sincere Vote (%)	49.46	67.74	57.98	5.80
Incumbent's Sincere Vote, Ranked	4.13	78.38	41.25	23.67
Log Electoral Fraud (%)	8.72	30.83	17.82	6.65
Electoral Fraud, Ranked	4.13	78.38	41.25	23.67
Log Mean Cluster Fraud	1.90	3.72	2.69	0.55
Rating of Democraticness (%)	18.15	40.95	29.50	6.11
Log Population Over Working Age (%)	7.42	23.59	15.73	4.76
Higher Education (%)	12.95	22.02	17.04	2.59
Rural Residents (%)	8.33	56.96	30.83	13.36
Employed in Agriculture (%)	1.49	23.53	12.08	6.36
Log GRP per Capita (RUB)	214685.4	375652.7	283236.9	49859.4
GRP growth (%)	-0.32	9.67	4.30	3.05
Log Unemployment, %	8.86	19.21	13.27	2.68
Below Living Minimum (%)	13.00	40.40	24.26	8.41
Log Natural Resources per Capita (RUB)	159268.0	466838.0	298727.6	96152.9
Share of Transfers in the Budget (%)	4.43	71.61	28.17	20.19
Log Social Spending per Capita (RUB)	65273.1	141283.5	95129.5	23094.3
Log Proportion of Reg. and Municipal Officials to the Employed (%)	1.37	2.38	1.76	0.31
Proportion of Employed in Education to the Employed (%)	7.04	15.19	9.58	2.39
Proportion of Employed in Healthcare to the Employed (%)	5.48	9.35	7.27	1.31
Money Per Regional and Municipal Official Inflation Adjusted	593013.8	1975817.9	1264404.7	373225.6
Money Per Person Employed In Education Inflation Adjusted	339047.4	598637.7	445485.3	79188.8
Money Per Person Employed In Healthcare Inflation Adjusted	252469.5	540398.7	379178.8	80911.8
Time-Invariant Variables				
Index of Press Freedom, 2010	1	3	1.93	.68
Media Persecution Index	3.93	76.97	29.48	29.03
Ethnoreligion Index	19.91	74.97	42.53	16.65

Note: a. The average between-year statistics are presented, that is, each statistic is firstly calculated for each year of 2000, 2004, 2008, and 2012 and then averaged between the years.

Appendix F2. Alternative models of consumption of transfers

Table F2. OLS and the multilevel models explaining consumption of transfers, by year only

DV: Share of Transfers in the Budget	OLS, 2000	OLS, 2004	OLS, 2008	OLS, 2012	Fixed Eff., 2000–2012
(Constant)	-53.98*** (-2.68)	17.59 (1.17)	14.98 (1.49)	21.45** (2.26)	.93 (.06)
Log Regional Taxes Per Capita, RUB	-6.9e-4*** (-6.79)	-8.8e-4*** (-8.7)	-7.4e-4*** (-9.51)	-8.5e-4*** (-10.66)	-7.8e-4*** (-13.32)
Log Reg. & Municipal Officials in Employed, %	25.96*** (3.26)	16.73*** (3.36)	27.88*** (7.85)	24.49*** (6.03)	23.63*** (7.41)
Healthcare in Employed, %	4.5*** (2.73)	2.3* (1.72)	.48 (.56)	-.14 (-.13)	1.81* (1.93)
Log Money per Reg. and Munic. Official, RUB	-2.3e-6 (-.43)	6.7e-6* (1.93)	1.9e-5*** (4.96)	1.6e-5*** (2.67)	1.0e-5** (2.31)
Log Money per Person in Healthcare, RUB	2.4e-4*** (3.84)	4.7e-5* (1.9)	1.7e-6 (.1)	2.7e-5* (1.96)	7.1e-5* (1.7)
R^2 (Random Eff. R^2)	.571	.723	.785	.781	(.726)
White Test	.000	.003	.000	.143	n.a.
N	83	83	83	83	332
DV: Share of Transfers in the Budget	OLS, 2000	OLS, 2004	OLS, 2008	OLS, 2012	Fixed Eff., 2000–2012
(Constant)	-5.45 (-.34)	15.6 (1.39)	9.4 (.96)	14.18* (1.71)	8.4 (1.33)
Log Regional Taxes Per Capita, RUB	-4.8e-4*** (-4.43)	-7.5e-4*** (-6.93)	-7.2e-4*** (-7.85)	-7.3e-4*** (-8.44)	-6.6e-4*** (-10.34)
Log Reg. & Municipal Officials in Employed, %	25.27** (2.6)	15.93*** (3.31)	24.16*** (5.94)	23.05*** (5.38)	20.97*** (6.81)
Education in Employed, %	2.26** (2.5)	2.37*** (3.77)	1.12 (1.53)	.84 (1.35)	1.81*** (4.21)
Log Money per Reg. and Munic. Official, RUB	9.4e-6* (1.7)	7.3e-6** (2.37)	1.7e-5*** (4.11)	1.5e-5** (2.3)	1.0e-5*** (4.09)
Log Money per Person in Education, RUB	-1.5e-5 (-.24)	5.3e-6 (.21)	1.3e-5 (.82)	1.1e-5 (.62)	1.0e-5 (1.09)
R^2 (Random Eff. R^2)	.523	.749	.792	.775	(.719)
White Test	.000	.053	.000	.116	n.a.
N	83	83	83	83	332

Note: Entries are unstandardized coefficients with t-values in parentheses. The multilevel models presented in the last column fit by maximizing the penalized quasi-likelihood (PQL) with the general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. The random term consists of intercepts and coefficients for all variables in the equation varying by year. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

The results of the fixed effects models are in line with results presented in the main text: central transfers are appropriated mostly by the bureaucracy, rather than used for mass patronage purposes. As follows from the t-values, the proportion of regional and municipal officials is 3.8 times more significant compared with the proportion of employed in the field of healthcare and 1.6 times more significant than the proportion of employed in the field of education. The variable of money allocated per one official in the regional budget turns out to be

1.4 times more significant than the variable of money assigned to a person employed in the field of healthcare and 3.8 times more significant than the variable of money assigned to a person employed in the field of education. In the temporal dimension, the effects of variables associated with elite consumption gain in size from year to year, meanwhile the effects of variables of patronage spending gradually fall into decline. Although the coefficients of the relative size of the bureaucracy are almost constant over time, t-values indicate double growth of their significance between 2000 and 2012 in the both model specifications. The coefficients of spending on the bureaucracy, in both specifications, follow an increasing trend with the apex in 2008 and then somewhat decline in 2012. Meanwhile the coefficients of the elite consumption are significant in nearly all models, the relative size of education and healthcare were significantly associated with the transfers only in 2000 and 2004. Since then these effects have come to naught. The effect of the money per employed in healthcare faded away from 2000 to 2008 but then revived in 2012 to a moderate extent whereas the effect of the money per employed in education appeared to be insignificant in all years.

Table F3. Multilevel models explaining consumption of transfers: two competing variables controlling for regional tax revenue

DV: Share of Transfers in the Budget	Fixed Eff., 2000–2012	Fixed Eff., 2000–2012	Fixed Eff., 2000–2012	Fixed Eff., 2000–2012
(Constant)	15.67* (1.71)	13.65** (2.21)	49.21*** (8.2)	52.81*** (10.29)
Log Regional Taxes Per Capita, RUB	-.00044*** (-7.47)	-.00039*** (-7.25)	-.00058*** (-4.81)	-.00053*** (-4.27)
Log Reg. & Municipal Officials in Employed, %	21.08*** (4.41)	15.5*** (5.05)		
Healthcare in Employed, %	1.17 (1.39)			
Education in Employed, %		1.73*** (3.9)		
Log Money per Reg. and Munic. Official, RUB			5.3e-6 (1.53)	7.3e-6** (2.24)
Log Money per Person in Healthcare, RUB			5.0e-5** (2.04)	
Log Money per Person in Education, RUB				1.29e-5 (.79)
R^2 (Random Eff. R^2)	.492	.516	.413	.378
N	332	332	332	332

Note: Entries are unstandardized coefficients with t-values in parentheses. The multilevel models presented in the last column fit by maximizing the penalized quasi-likelihood (PQL) with the general positive-definite covariance structure for the random effects, Log-Cholesky parametrization. The random term consists of intercepts and coefficients for all variables in the equation varying by year and budget type. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Appendix F3. An alternative measure of electoral fraud

Table F4. Multilevel models explaining electoral fraud in 2000–2012, fixed effects, the mean cluster of data

DV: Log Mean Cluster	Full Model	Full Model w/o Ethnicity	Social Cleavages	Economic Explanations	Clientelism	Best Model	Best Model w/o Ethnicity
Constant	2.596*** (5.0)	2.765*** (4.92)	1.9*** (21.85)	3.588*** (20.48)	2.68*** (12.02)	2.685*** (13.99)	2.483*** (9.6)
Ethnoreligion Index	.0133*** (6.39)		.0127*** (6.61)			.0142*** (5.53)	
Rural Residents, %	.0053 (.74)	.013* (1.77)	.0053 (1.38)				.0155*** (3.41)
Employed in Agriculture, %	.0024 (.27)	-.0023 (-.25)	.0073 (1.03)				
Log GRP per Capita, RUB	-2.0e-6 (-1.06)	-1.9e-6 (-.98)		-4.5e-6*** (-6.19)		-2.1e-6** (-2.28)	
GRP growth, %	.0087 (.87)	.01 (1.09)		.026** (2.21)			
Log Natural Resources per Capita, RUB	-1.0e-6** (-2.2)	4.4e-7 (1.0)		8.9e-7*** (3.0)		9.4e-7*** (-2.63)	3.6e-7** (2.09)
Share of Transfers in the Budget, %	-.001 (-.43)	.0049* (1.92)			.0116*** (5.85)		.0066*** (3.48)
Log Reg. & Municipal Officials in Employed, %	-.142 (-.8)	-.361** (-1.99)			-.2818* (-1.94)		-.4783*** (-3.11)
Log Money per Reg. and Munic. Official, RUB	1.7e-7** (2.14)	2.3e-7*** (2.81)			1.3e-7* (1.85)	1.5e-7* (1.86)	2.1e-7*** (3.08)
Random Effects R-squared	.374	.279	.254	.139	.151	.292	.224
Number of obs. by Year	Minimum – 80; Average – 81.5; Maximum: 83						
Total N of obs.	326						

Note: See comments to Table 6.2 for details. The dependent variable is the mean cluster as it is reported in Appendix D1. Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Appendix F4. Non-monotonicity of the relationship between regional ethno-religious makeup and the sincere incumbent's vote

Table F5. Multilevel models explaining the sincere incumbent's vote at different levels of the Ethnoreligion Index and sincere incumbent's vote, fixed effects 2000–2012

DV: Sincere Incumbent's Vote, %	SV & EI < 95th percentile[a]	SV & EI < 93rd percentile[a]	SV & EI < 90th percentile[a]	SV & EI < 85th percentile[a]	SV & EI < 80th percentile[a]
Constant	79.44*** (18.48)	76.71*** (15.46)	75.46*** (14.28)	77.27*** (13.96)	78.55*** (11.83)
Ethnoreligion Index	.0738*** (3.16)	.0732** (2.38)	.046 (1.43)	.0393 (1.01)	.0353 (.91)
Higher Education, %	-.5042*** (-3.17)	-.3957*** (-2.95)	-.4654*** (-3.07)	-.5585*** (-3.76)	-.5598*** (-3.7)
Log GRP per Capita, RUB	-4e-5*** (-2.78)	-3e-5*** (-3.26)	-2e-5** (-2.07)	-3e-5** (-2.32)	-3e-5** (-2.47)
GRP growth, %	.3182 (1.53)	.2259 (1.16)	.3129* (1.7)	.3439* (1.84)	.3674* (1.93)
Below Living Minimum, %	-.157** (-2.0)	-.1815** (-2.1)	-.1519** (-2.27)	-.1374 (-1.65)	-.1396 (-1.56)
Employed in Agriculture, %	-.3252*** (-3.59)	-.2578*** (-4.0)	-.281*** (-4.11)	-.2689*** (-3.73)	-.2652*** (-3.59)
Random Effects R^2	.243	.222	.192	.202	.219
N	299	290	275	247	230

Note: Entries are unstandardized coefficients with t-values in parentheses. See comments to Table 6.5 for details. a. The sample includes observations if values of the sincere vote (SV) and the Ethnoreligion Index (EI) are below their 95th percentiles (70.9, 74.4, respectively), 93rd percentiles (69.4, 73.9), 90th percentiles (68.2, 80.8), 85th percentiles (66.9, 60.1), and 80th percentiles (65.4, 56.7). Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Table F6. Multilevel models explaining the sincere incumbent's vote at different levels of the mean cluster of fraud, fixed effects 2000–2012

DV: Sincere Incumbent's Vote, %	Cluster Mean < 90th percentile	Cluster Mean < 80th percentile	Cluster Mean < 70th percentile	Cluster Mean < 65th percentile	Cluster Mean < 60th percentile
Constant	73.47*** (18.08)	76.96*** (17.84)	77.78*** (15.36)	77.0*** (13.0)	79.32*** (12.58)
Ethnoreligion Index	.0836*** (3.34)	.066** (2.23)	.0613* (1.76)	.038 (.70)	.01 (.32)
Higher Education, %	-.49*** (-3.4)	-.5878*** (-3.57)	-.6074*** (-3.94)	-.68*** (-4.13)	-.706*** (-4.07)
Log GRP per Capita, RUB	-2e-5** (-2.39)	-3e-5*** (-2.69)	-3e-5** (-2.34)	-2e-5 (-1.13)	-2e-5 (1.38)
GRP growth, %	.341** (1.97)	.3913** (2.46)	.3384** (2.02)	.2813 (1.57)	.2772 (1.51)
Below Living Minimum, %	-.0742 (-1.29)	-.0593 (-1.07)	-.0599 (-1.15)	-.0782 (-1.46)	-.0667 (-1.2)
Employed in Agriculture, %	-.278*** (-3.69)	-.3461*** (-4.74)	-.3736*** (-5.14)	-.349*** (-3.74)	-.362*** (-4.21)
Random Effects R^2	.200	.222	.220	.221	.210
N	294	258	235	212	191

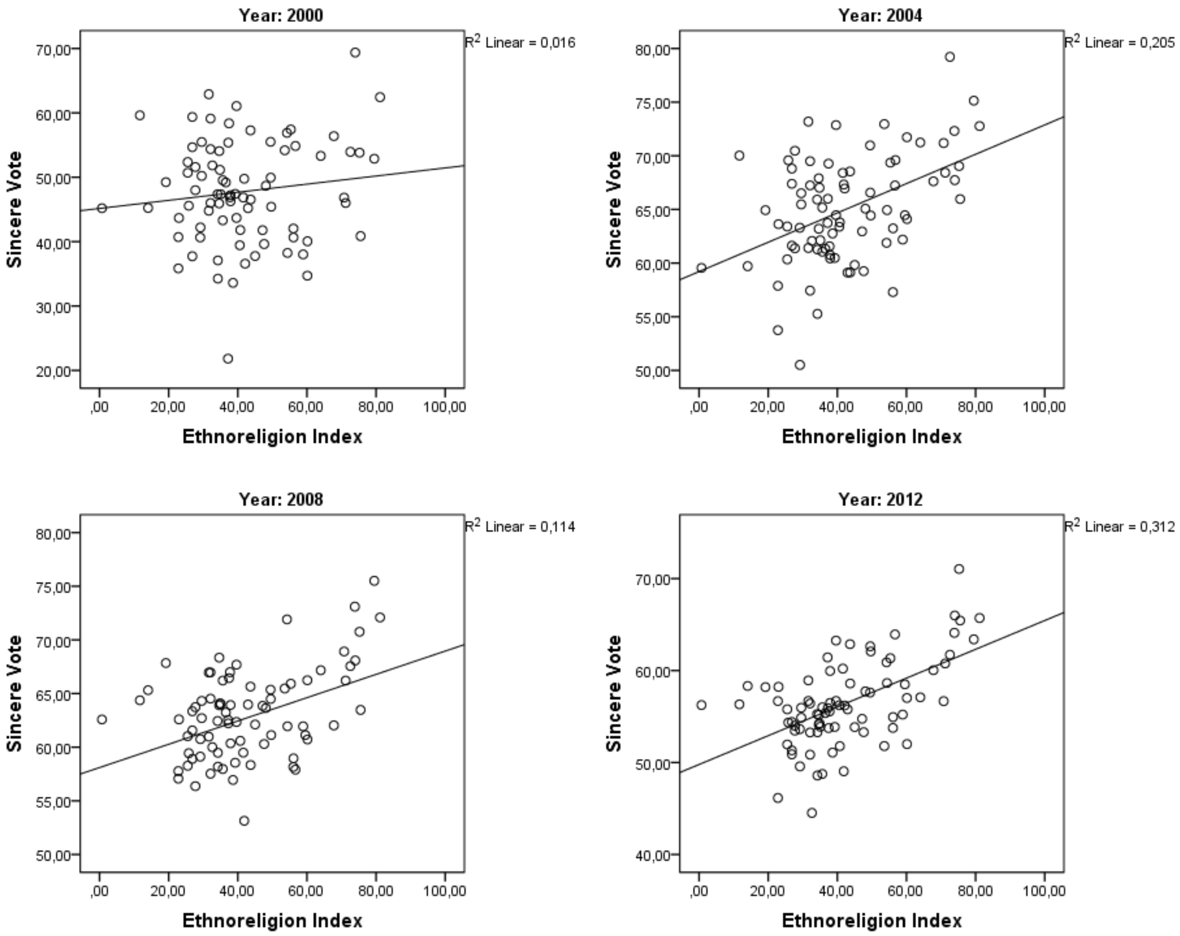
Note: Entries are unstandardized coefficients with t-values in parentheses. See comments to Table 6.5 for details. The sample includes observations if values of the mean cluster (See Appendix D1) are below its 90th percentile (3.49), 80th percentile (3.12), 70th percentile (2.91), 65th percentile (2.84), and 60th percentile (2.75). Significant at: *p < 0.1, **p < 0.05, ***p < 0.01.

Table F5 presents several specifications of the best model from Table 6.5 in which observations with upper values of the sincere vote (SV) and the Ethnoreligion Index (EI) are gradually removed. The level of statistical significance of the Ethnoreligion Index indicated by t-values declines from 5.4 in Table 6.5 to 2.4 if the SV and the EI are limited by their 93rd percentiles. The effect of the Ethnoreligion Index weakens dramatically and becomes insignificant if the sample includes observations with the SV and the EI below their 90th percentiles. The effects of variables of economic growth and the percentage of population with income below the living minimum are also affected by cutting off the upper values of the data. The effect of education tends to be stronger in the restricted samples.

A more straightforward way to test the sensitivity of the results to the extent of electoral fraud (i.e., quality of the dependent variable) is to run the models at various levels of electoral fraud. Table F6 displays fixed effects of the models of the sincere incumbent's vote including observations without high values of the mean cluster of fraud – the qualitative measure of fraud developed in Chapter 4. In this case, the Ethnoreligion Index also becomes insignificant if the cluster mean is below its 65th percentile (i.e., when nearly one third of observations is excluded). However, three other variables are also insignificant in the model. While economic development gradually lose their significance, the percentage of people with income below the living minimum is not significant in all restricted samples in the table, that is, the effect of this variable appears from few regions with extreme levels of electoral fraud. The effect of employment in agriculture is the most monotonic and the effect of education gets stronger among the regions with moderate and minor electoral manipulations.

It should be also noted that the relationship between the Ethnoreligion Index and the sincere incumbent's vote is not constant over time. Figure F1 shows that it is absent in 2000. In 2004 and 2008, the relationship is rather determined by a small group of observations located at the EI > 65 and the SV > 65. In the election year 2012, however, the relation is monotonic and relatively strong (R^2 = .312). Thus, the hypothesis that the variable of the sincere incumbent's vote represents more electoral fraud than the authentic vote at its high values, and therefore correlates with the variable of ethnicity, can be rejected. The level of the sincere voting for the incumbent is father a little bit higher in non-Russian and non-Christian Orthodox regions, especially in 2012.

Figure F1. The Ethnoreligion Index and the sincere incumbent's vote by year



Appendix F5. Zero-Skewness Log-Transformation Commands

Variables having strongly skewed distributions are transformed applying the algorithm described in Appendix E8.

This procedure comes up with the following transformation commands:

```
7.4917+4.7606*ln(Fraud2000-2.047556)
6.8214+6.9866*ln(Fraud2004-.5653532)
-19.6481+15.9406*ln(Fraud2008+5.775942)
-5.2616+11.2798*ln(Fraud2012+2.302548)
1.4762+1.8987*ln(ClusterMean00-.2218331)
3.0977+0.8242*ln(ClusterMean04-1.011411)
2.6759+1.1302*ln(ClusterMean08-.7729866)
2.9320+0.9368*ln(ClusterMean12-.8728499)
4.50+26.70+(-11,2853+11.6481*ln(-PopOverWorkingAge00+30.57747))*-1
5.50+26.40+(-7.3217+10.5747*ln(-PopOverWorkingAge04+29.76185))*-1
6.80+27.00+(0.4666+8.5468*ln(-PopOverWorkingAge08+29.0981))*-1
8.30+28.60+(3.8589+7.9992*ln(-PopOverWorkingAge12+30.34228))*-1
-123163.3378+19316.6413*ln(SocialSpendingPCInfAdj00+585.1581)
-122485.5221+25802.1145*ln(SocialSpendingPCInfAdj04-11053.55)
-169170.8418+27631.4469*ln(SocialSpendingPCInfAdj08-9644.458)
```

-148925.3893+27860.2289*ln(SocialSpendingPCInfAdj12-17370.56)
1.5797+0.5897*ln(RegAndMunicOfficialsInEmployed00-.1022941)
1.7670+0.7749*ln(RegAndMunicOfficialsInEmployed04-.1136453)
1.5880+1.0036*ln(RegAndMunicOfficialsInEmployed08+.0241918)
1.6083+0.8098*ln(RegAndMunicOfficialsInEmployed12-.0650549)
-4101892.8430+408238.5950*ln(MoneyPerRegAndMunicOfficial00-114751.8)
-5615372.0001+566036.0021*ln(MoneyPerRegAndMunicOfficial04-146601.7)
-4663929.3026+457470.8423*ln(MoneyPerRegAndMunicOfficial08-273228.2)
-2711490.8526+295114.8850*ln(MoneyPerRegAndMunicOfficial12-269323.8)
-242098.6700+43299.4613*ln(MoneyPerEmployedInEducationA00-62186.29)
-455786.3901+77234.1789*ln(MoneyPerEmployedInEducationA04-116799)
-1061638.5005+135344.0500*ln(MoneyPerEmployedInEducationA08-101121.1)
-714596.8876+110840.3211*ln(MoneyPerEmployedInEducationA12-183289.8)
-554948.0062+69931.2845*ln(MoneyPerEmployedInHealthcareA00+6803.793)
-597330.8268+85859.0790*ln(MoneyPerEmployedInHealthcareA04-95556.23)
-892905.3216+110055.5623*ln(MoneyPerEmployedInHealthcareA08-56754.29)
-1026339.0017+131059.0949*ln(MoneyPerEmployedInHealthcareA12-132816.9)
-9162.8630+73053.1000*ln(NatResources05-46.94832)
-75519.4223+150999.3380*ln(NatResources08-72.44271)
-189326.8737+284716.0540*ln(NatResources12-104.6205)

Note: Numbers in the final parts of variables' titles indicate years. Transformation commands for the variables associated with transfers additionally include inflation adjustment factors. The log-transformation cammands of variables that earlier appear in analysis in Chapter 5 are given in Appendix E8.

Appendix F6. The motivated reasoning theory to explain popular support for authoritarianism

Everything that has been done in this study is done within the framework of rational choice theory. However, as new events are unfolding, the limitations to rationality in the Russian public opinion and political support are becoming increasingly evident. In 2014, Russia was involved in the military conflict in Eastern Ukraine during which Putin was presented by the official media as a patriot who was protecting the "rights of the Russians" in Ukraine against the Nazi radicals of the Right Sector and other extreme-right paramilitary formations. After the referendum on the status of Crimea, the peninsula reunited with Russia on16 March. The Western community, however, considered this fact as annexation and imposed various sanctions on Russia. Besides that, oil prices slumped nearly twofold between August and December, thereby Russia appeared to be deprived of the large part of its prime source of income. Accordingly, the purchasing power of the ruble dropped precipitously from 36.1 rubles per one U.S. dollar in August 2014 to 65.2 RUB/USD in January 2015, 77.9 RUB/USD in January 2016; and then stabilized at a level of about 56 RUB/USD.[195]

[195] Official inflation numbers are relatively small but still perceptible to the ordinary consumer: year-to-year consumer price inflation amounted to 11.7% in 2014, 16.8% in 2015, and 5.6% in 2016, i.e., 37.9% of the cumulative inflation in three years. The cumulative amount may to some extent reflect the reality. However, it should be noted that the index of consumer price inflation consists of inflation rates of various goods and services and 37.9% is the average between them. Consumer goods, however, were much more influenced by inflation than services. The reliability of the inflation index is generally questionable since several items

A straightforward intuition of economic voting suggests that United Russia should definitely have lost the 2016 election. Nevertheless, not only did United Russia receive more than a half of the vote without resorting to outcome-changing fraud,[196] but also Putin's popular support measured by the leading survey agencies exceeded eighty percent[197] and Putin successfully won the election of 2018 with an unprecedented level of the vote of 76.7%. How could this happen? The regime has simply blamed the West for everything: dumping the oil prices, the intervention in Ukraine, influencing Russian politics, etc. And people were generally convinced by this explanation of their economic troubles. The popular mood of that time was summarized by an anecdote, when one Russian says: "I have never lived as badly as under the president Obama".[198]

But what is problematic in this viewpoint? Let's assume that the message of Russian television is generally true. It is the West that dumped the oil prices, orchestrated the Euromaidan to split Ukraine from Russia, and now rules Russia as a colony via the economic politics of the Russian Central Bank and the corrupted bloc of the liberals in the government. A set of counter-questions, however, can be raised. Who has built such an economy that appears to be so heavily dependent on oil? Who did not take any *peaceful* measures to prevent Ukraine from cultural splitting, while appointing such ambassadors to Ukraine who were formerly political bankrupts[199], and considered that gas blackmail decides everything in the relations between the two countries? Who appoints those liberals to the government posts and approves the Central Bank leadership? Who sends the military divisions to Syria to allegedly fight the Islamic terrorists "in collaboration with the international community" meanwhile waging war against the West? There are too many contradictions in the official propaganda to mention all of them here. However, people mostly do not see them and prefer to be cheated by the regime. And the question is why.

A possible explanation can be taken from political psychology, more specifically, from the motivated reasoning theory (Kunda 1990; Westen et al. 2006; Lodge and Taber 2013). The theory suggests that people tend to reject even overwhelming

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included in the index manifest evident miscalculations. For example, imported cars have reportedly become 8.7, 16.5, and 8.5 percent more expensive in the years 2014, 2015, and 2016, respectively. In reality, the prices of imported cars rose proportionately to the ruble exchange rate (it could not have been otherwise). A more interesting fact is that these inflation values do not considerably differ from the inflation index values of the domestically produced cars of Russian automakers – 4.9, 18.9, and 4.6 percent, respectively (https://www.fedstat.ru/indicator/31074).

[196] See a preliminary analysis of S. Shpilkin at: http://podmoskovnik.livejournal.com

[197] The Russian Public Opinion Research Center's (VCIOM) estimate of Putin's approval rating rose from 64.3% in February 2014 to 82.2% in April, and until the fall of 2015 it never decreased below 80%; in October 2015 it reached the highly improbable value – 89.9% (VCIOM 2015). The Putin's approval rating of the Levada-Center similarly raised from 65% in January 2014 to 82% in April, and it never declined below the 80-percent level until the middle of 2017 (Levada 2017).

[198] See, for example, Troitsky (2015).

[199] Victor Chernomyrdin, the Russian ambassador to Ukraine from 2001 to 2009, formerly held office of the prime minister of the Russian government (1993–1998) and was accountable for many economic problems of the 1990s. Mikhail Zurabov, the Russian ambassador to Ukraine from 2009 to 2016, is ex-minister of healthcare and social development. Besides large reductions in medicine, he is also notorious for being an initiator of the reform of the "Monetization of [social] benefits" (the federal law No. 122), which triggered a large-scale protest among pensioners.

evidence that contradicts their prior attitudes on an issue because this contradictious evidence engenders an emotional conflict known as cognitive dissonance, which is associated with very uncomfortable psychological conditions. Research has shown that motivated reasoning produces various biases in the ways people acquire and process information. While summarizing findings of their studies, Lodge and Taber (2007: 35) note:

> "[f]irst, people simply feel that the information they agree with is stronger than the information with which they disagree. Second, when thinking about the evidence on a policy issue, people actively denigrate the information with which they disagree while accepting supportive information with little scrutiny. Third, people seek out confirmatory information and avoid evidence that might challenge their priors. Fourth, all of these biases conspire to drive attitudes further in the direction of priors the more they think and reason about the issues. Finally, all of these biases are particularly pronounced for citizens with more knowledge and stronger political attitudes, the very folks on whom democratic theory relies most".

These findings have been confirmed by the other studies (Westen et al. 2006; Nyhan and Reifler 2010; Robertson 2017).[200]

However, it should be underlined that the psychological simplifying mechanism, a cognitive shortcut, underlying the process of motivated reasoning is *not* vicious as such. Having a large number of observations and a linear trend, which perfectly summarizes them, one does not need to consider in detail all the circumstances of each new case in order to make a judgment, since it can be reliably inferred from the linear trend. Similarly, having learned a candidate's position and policy performance on issues a, b, c,… y, one may with high degree of reliability predict the candidate's standing on issue z and the probable policy outcome on this issue. A problem is that people frequently do not update their attitudes when new contradictious facts appear but instead they reject the evidence and stick to their false beliefs. Not the use of cognitive shortcuts in the process of searching and

[200] Westen and colleagues (2006) studied strong partisans during the U.S. presidential election of 2004. The subjects were shown a set of initial, contradictory, and exculpatory statements of their co-partisan candidates and oppositional candidates (many of these statements and quotations were edited or fictionalized). While evaluating the degree of inconsistency of the statements, subjects identified the statements of their own candidates as much less contradictory compared with the statements of the oppositional candidates. Besides that, motivated (as opposed to "cold") reasoning, as detected by magnetic resonance imaging (MRI), appeared to activate the parts of the brain associated with emotions.

To investigate the extent to which false or unsubstantiated beliefs can be corrected by alternative information, Nyhan and Reifler (2010) conducted a series of experiments in which subjects read mock news articles reporting misleading information and correction paragraphs on three salient issues in U.S. politics: 1) that Iraq had weapons of mass destruction; 2) president Bush's tax cuts have increased government revenue; and 3) president Bush had banned stem cell research. The results indicate that not only did corrections have no effect on misperceptions, but also conservative subjects (i.e., G.W. Bush supporters) in several instances increased their misperceptions as a reaction against correction statements (i.e., a "backfire effect").

Based on a survey experiment from the Russian presidential election of 2012, Robertson (2017) demonstrates that regime supporters, when evaluating their trust in electoral observers, disregarded positive information about OSCE and *Golos* observers, while showed lower trust when presented with regime-generated negative information that *Golos* is the U.S. agent. Regime opponents, by contrast, increased their trust in observers when they learned that observers came from the OSCE, opponents also were immune to the image of *Golos* as the U.S. agent, yet they were persuaded by the two-minute NTV television clip entitled "Voice from Nowhere" portraying *Golos* as a politically engaged organization working for U.S. interests.

evaluating of information but rather the systematic rejection of contentious facts and the acceptance of mentally proximate yet admittedly false information constitute the essence of motivated reasoning.

The literature on motivated reasoning jointly views people as *biased reasoners* who evaluate new emotionally-relevant information on the basis of the pre-existing beliefs, opinions, and attitudes. However, this literature says nothing about how the psychological mechanisms involved in the process of motivated reasoning can generate incumbency advantage for a candidate, even if the candidate has a monopolistic access to the sources of the spread of information. Following the theory, opponents of the incumbent would reject state-sponsored propaganda as contradictory to their prior attitudes regardless of facts supporting it, even if it dominates the media. That is, the theory cannot explain why authoritarian incumbents' popular coalitions enlarge and dwindle over time, in particular, how state-sponsored propaganda can reach hearts and minds of moderate and opposition voters. The fact of the broad popular acceptance of admittedly false information disseminated by the biased media under authoritarianism is not accounted for by existing theories so far. As Guriev and Treisman (2015: 4) note, "the effectiveness of propaganda in authoritarian regimes is a prima facie puzzle. Given that citizens know the dictator has an incentive to lie about his type [of competence], why do they ever listen?"

An extension of the motivated reasoning theory to the purposefully distorted information provided by the biased media in authoritarian regimes suggests that voters may adopt admittedly false information not only because they are regime supporters but also due to psychological attractiveness of propaganda compared with true information. The biased media tend to exaggerate incumbent's achievements and gloss over his faults by portraying the country's political and economic affairs in such a fashion that the authoritarian leader's political decisions are indisputably the best possible solutions. They also tend to blame regime opponents or foreign powers for worsening of the economy or other difficulties that chiefly result from the incumbent's incompetence or immanent characteristics of authoritarianism (such as pervasive elite corruption that is permitted and even encouraged by the incumbent as a form of payment for political loyalty). And almost always propaganda draws favorable perspectives for the future. In a grotesque manner, the work of propaganda in Putin's Russia can be summarized in the following core messages. 1. "Putin is the best." 2. Toward a successful event: "he outwitted everyone, it was the cunning plan of Putin (*khitryy plan Putina*)." 3. Toward an unsuccessful event: "it should be so, it is stipulated in the cunning plan of Putin, he will outwit everyone in future." 4. "Who else, if not Putin?" 5. "Americans, Anglo-Saxons, NATO, and Ukrainians (*Ukry*) are guilty for everything." 6. "The cunning plan of Putin will have inevitably worked." In particular, 6.1. "[Donald] Trump is our candidate, he will help us to restore good relationships with America." 6.2 "We will combat terrorism in the far reaches in Syria, it will allow us to eliminate terrorists there lest they come here." 6.3. "The Olympic Games of 2014 and the 2018 FIFA World Cup will raise prestige of the country, we will be again respected abroad."... Then return to a message from the 1st to the 5th conditionally on the outcome of the 6th.

The reality may and frequently is in a sharp contrast with propaganda. Having reality with its detrimental consequences of the incumbent's policies for the country in general and for the voter in particular on the one hand and propaganda with its, speaking in Stalin's words, appealing message that "life has become better, life has become merrier" – on the other hand, the voter then has to choose between two options: whether, loosely speaking, everything is bad or everything is nice. The last option is psychologically more attractive inasmuch as propaganda reduces psychological costs of perception of the reality. And the greater the discrepancy between the reality and its propagandist interpretation is, the more incentives the voter has to turn and stick to the "better" option.

It might be argued that so long as motivated political reasoning is of emotion-based and largely subliminal character, this principal decision is unconscious. To some extent, this is true. Taber and Lodge (2016: 62) argue that conscious thinking "is the cart and not the horse, in which case our explicit reasoning processes serve to *rationalize* behavior rather than to cause it". On the other hand, it is not the case of "hot cognition" to rest responsibility entirely on the sphere of the unconscious since voters have enough time (months if not years) for cold rational consideration and re-evaluation of authoritarian policies. Scholars underline that motivated reasoning theory shares a common assumption with rational choice theory, namely, that rational decision makers aim to maximize the net balance of costs and benefits (Lodge and Taber 2007: 40). The specificity of motivated reasoning behaviour is that it aims to maximize *psychologically perceived* utility (i.e., to minimize negative and maximize positive affect states) rather than physically existing utility. That is, the process of estimation of benefits is mediated by human psychology. Therefore, we cannot conclude that voters deny the truth unconsciously. They deliberately close their eyes to faults of authoritarian leaders and understand that by doing so they maximize their positive emotions and use their mind to *rationalize* and justify their psychological decisions.

Thus, not simply do the voters not see the reality while being indoctrinated by the official propaganda, they maliciously refuse to see it. If their fridge shows them that they have become less well off, but the TV set tells the contrary, they would rather believe the TV set because looking at the world through the lens of rose-colored glasses gives them more joy and less pain. Since the truth is unflattering and painful, searching for it is costly, but lies are widely available, pleasant, and seductive, there are few of those who wish to follow the narrow way of truth-seeking. Put otherwise, the root of the evil, which is popular support for authoritarianism, is that people value personal utility higher than the truth or justice. And even though several of them manage to reap some poisonous fruits offered by the regime, the society in general does not only lose its welfare but also paves its historical way to nowhere.

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