This volume offers a number of forensic indicators of election fraud applied to official election returns and tests and illustrates their application in Russia and Ukraine. Included are the methodology’s econometric details and theoretical assumptions. The applications to Russia include the analysis of all federal elections between 1996 and 2007 and, for Ukraine, between 2004 and 2007. Generally, we find that fraud has metastasized within the Russian polity during Putin’s administration with upwards of 10 million or more suspect votes in both the 2004 and 2007 balloting, whereas in Ukraine, fraud has diminished considerably since the second round of its 2004 presidential election in which between 1.5 million and 3 million votes were falsified. The volume concludes with a consideration of data from the United States to illustrate the dangers of the application of our methods without due consideration of an election’s substantive context and the characteristics of the data at hand.

Mikhail Myagkov is a graduate of the Moscow Institute of Physics and Technology and holds a PhD from the California Institute of Technology. A specialist in Russian politics, political methodology, and laboratory experiments in political economy, he has published extensively in Post-Soviet Affairs.

Peter C. Ordeshook is a member of the American Academy of Arts and Sciences and has published more than 120 papers in professional journals, including the American Political Science Review, Post-Soviet Affairs, Constitutional Political Economy, and Post-Soviet Geography and Economics. His authored and coauthored books include An Introduction to Positive Political Theory, Game Theory and Political Theory, The Balance of Power, Designing Federalism, A Political Theory Primer, Endogenous Time Preferences in Social Networks, and Lessons for Citizens of a New Democracy (in English, Italian, and Ukrainian).

Dimitri Shakin holds a PhD in mathematics from Moscow State University. He is a specialist in commutative algebra, financial econometrics, and Russian politics.
This volume is dedicated to the late Dr. Alexander Sobyanin, scientist, colleague, and friend, who wanted only one thing for Russia – Democracy.
Contents

List of Tables  page vii
List of Figures  ix

Introduction  1

1 A Forensics Approach to Detecting Election Fraud  12
  1.1 Fraud and Forensics  12
  1.2 The Special Relevance of Russia and Ukraine  25
  1.3 Outline  29

2 The Fingerprints of Fraud  30
  2.1 Indicators  30
  2.2 Turnout and Absolute Vote  32
  2.3 The Distribution of Turnout  42
  2.4 Stuffed Ballot Boxes versus Stolen Votes  44
  2.5 The Flow of Votes  47
  2.6 Evaluating Our Ecological Method  53
  2.7 Simulating Fraud  59
  2.8 Overview  69

3 Russia  71
  3.1 Suspicious Anomalies of Russian Elections  71
  3.2 The Distribution of Turnout  82
  3.3 Who Wins the Extra Votes  90
  3.4 The Flow of Votes  101
  3.5 Republics versus Oblasts  109
  3.6 Trends in Russian “Democracy” and the 2007 Duma Vote  116
  3.7 Players and Motives  135
Contents

4 Ukraine 2004
  4.1 Rounds 1 and 2, 2004
  4.2 December 26, 2004
  4.3 Motives

5 Ukraine 2006 and 2007
  5.1 The Parliamentary Election of 2006
  5.2 The 2007 Contest
  5.3 Conclusions

6 The United States
  6.1 California, North Carolina, and Arizona
  6.2 Florida
  6.3 Idaho and Texas
  6.4 Ohio 2004
  6.5 Conclusions

References
Index
### List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Average Bias for Different Estimators</td>
<td>55</td>
</tr>
<tr>
<td>2.2</td>
<td>Flow of Votes, 2003–2005, Moscow</td>
<td>57</td>
</tr>
<tr>
<td>2.3</td>
<td>Diagnostic Statistics, Moscow</td>
<td>58</td>
</tr>
<tr>
<td>2.4</td>
<td>Flow of Votes, 2003–2005, Novosibirsk</td>
<td>60</td>
</tr>
<tr>
<td>2.5</td>
<td>Diagnostic Statistics, Novosibirsk</td>
<td>61</td>
</tr>
<tr>
<td>2.6</td>
<td>Case 1 Fraud (Votes Transferred from 2 to 1)</td>
<td>64</td>
</tr>
<tr>
<td>2.7</td>
<td>Case 1, Relationship between $T$ and $V/E$</td>
<td>65</td>
</tr>
<tr>
<td>2.8</td>
<td>Case 2 Fraud (Votes Transferred from Nonvoters to 1)</td>
<td>66</td>
</tr>
<tr>
<td>2.9</td>
<td>Case 2, Relationship between $T$ and $V/E$</td>
<td>66</td>
</tr>
<tr>
<td>2.10</td>
<td>Case 3 Fraud (Votes Transferred from 2 to Nonvoters)</td>
<td>67</td>
</tr>
<tr>
<td>2.11</td>
<td>Case 3, Relationship between $T$ and $V/E$</td>
<td>68</td>
</tr>
<tr>
<td>2.12</td>
<td>Case 4, Fraud</td>
<td>69</td>
</tr>
<tr>
<td>3.1</td>
<td>Some Peculiar Trends in Russian Elections</td>
<td>72</td>
</tr>
<tr>
<td>3.2</td>
<td>Rayons with the Greatest Shift in Vote between Rounds, 1996</td>
<td>75</td>
</tr>
<tr>
<td>3.3</td>
<td>Nurlatinski Rayon, Tatarstan, 2004</td>
<td>81</td>
</tr>
<tr>
<td>3.4</td>
<td>Maximum Turnout Advantage by Region</td>
<td>98</td>
</tr>
<tr>
<td>3.5</td>
<td>Number of Regions in Which a Candidate Is Advantaged by Increased Turnout</td>
<td>99</td>
</tr>
<tr>
<td>3.6</td>
<td>The Republics and Turnout Advantage, 1996–2004</td>
<td>100</td>
</tr>
<tr>
<td>3.7</td>
<td>Estimated Flow of Votes from 1995 to 1999, 1999 to 2000</td>
<td>102</td>
</tr>
<tr>
<td>3.8</td>
<td>Flow of Votes from 1999 to 2003</td>
<td>104</td>
</tr>
<tr>
<td>3.9</td>
<td>Flow of Votes from 2000 to 2004</td>
<td>106</td>
</tr>
<tr>
<td>3.10</td>
<td>Flow of Votes from 2003 to 2004</td>
<td>108</td>
</tr>
</tbody>
</table>
List of Tables

3.11 Flow of Votes from 1999 to 2003, Republics versus Oblasts 111
3.12 Flow of Votes from 2003 to 2004, Republics versus Oblasts 112
3.13 T versus V/E for United Russia, Moscow, and St. Petersburg 2007 133
4.1 Comparing the Relative Advantage of Increased Turnout, Round 2 150
4.2 Flow of Votes, Ukraine 2004, Round 1 to Round 2 160
4.3 Suspect Votes by Different Methods 161
4.4 Flow of Votes from Round 2 to Round 3 165
4.5 Total Votes for a Candidate versus Total Cast 175
5.1 Flow of Votes from 2002 to 2006 186
5.2 Flow of Votes from 2004 to 2006 188
5.3 Outcomes of 2006 and 2007 Compared 199
5.4 Flow of Votes from 2006 to 2007 200
5.5 Volynsk Oblast, Coefficient on T by Election District (Intercept, $R^2$) 210
6.1 T versus V/E for Idaho, 1992–2004 250
List of Figures

2.1 Turnout versus V/E, Russian Constitutional Referendum 1993  page 33
2.2a Example of Potential Aggregation Error  37
2.2b Four “Regions” Disaggregated  37
2.3 Distribution of Coefficients for T, Russian Constitutional Referendum 1993  41
2.4 Impact of Stuffed Ballot Boxes  43
2.5a T versus V/E, Artificial Data Absent Fraud  45
2.5b T versus V/E, Artificial Data with Stolen Votes  45
2.6 Case 1 Simulation, Distributions of Turnout  64
2.7 Case 2 Simulation, Distributions of Turnout  65
2.8 Case 3 Simulation, Distributions of Turnout  67
3.1a Turnout in 2004 versus 2000  73
3.1b Turnout in 2000 versus 1999  73
3.2a All U.S. Counties, Bush 2004 versus 2000  77
3.2b Putin’s Vote Compared  77
3.3a CPRF 1999 versus 1995  79
3.3b CPRF 2003 versus 1999  79
3.3c Zyuganov 2000 versus 1996(1)  79
3.3d Haritonov 2004 versus Zyuganov 2000  80
3.3e Edinstvo and Otechestvo 1999 versus NDR 1995  80
3.3f United Russia 2003 versus Edinstvo and Otechestvo 1999  80
3.4a Distributions of Presidential Turnout, Oblasts  84
3.4b Distributions of Duma Turnout, Oblasts  84
3.5a Distribution of Presidential Turnout, Republics  85
List of Figures

3.5b Distribution of Duma Turnout, Republics 85
3.6 Distribution of Turnout 2004 Compared to 2000 87
3.7a Urban versus Rural Turnout, Presidential, Oblasts 89
3.7b Urban versus Rural Turnout, Presidential, Republics 89
3.8a T versus V/E, Tatarstan 2004 92
3.8b T versus V/E, Bashkortostan 2004 92
3.8c T versus V/E, Tver 2004 92
3.8d T versus V/E, Samara 2004 93
3.9a Presidential Turnout Distribution, Urban Republic Rayons 123
3.9b Duma Turnout Distribution, Urban Republic Rayons 123
3.9c Turnout Distribution, Rural Oblasts 123
3.10a Turnout Distributions, 2007 versus 2003 127
3.10b Turnout Distributions, 2007 versus 2004 127
3.11a Distribution of Precinct Turnout 2007 129
3.11b Distribution of Precinct Turnout, Ukraine Third Round 2004 129
3.12 Turnout Distributions, Presnya Rayon, Moscow 129
3.13a Turnout Distributions, Moscow, St. Petersburg Rayons 2007 132
3.13b Turnout Distributions, Moscow, St. Petersburg Precincts 2007 132
4.1a Turnout, 1999 and 2004 First Round, Ukraine 143
4.1b Turnout of Rounds 1 and 2 Compared, 2004, Ukraine 143
4.2 The “Bump,” Ukraine Round 2 144
4.3a Turnout Change between Rounds, 11:00 A.M. 146
4.3b Turnout Change between Rounds, 3:00 P.M. 146
4.3c Turnout Change between Rounds, 8:00 P.M. 146
4.4a T versus V/E, Yanukovich Rayons, Round 2 149
4.4b T versus V/E, Yushchenko Rayons, Round 2 149
4.5a T versus V/E, Kharkiv Rayons 153
4.5b T versus V/E, Dnipropetrovsk Rayons 153
4.5c T versus V/E, Luhansk Rayons 153
4.5d T versus V/E, Donetsk Rayons 154
4.5e T versus V/E, Lviv Rayons 154
4.5f T versus V/E, Ivano-Frankiv'sk Rayons 154
4.6a T versus V/E, Crimea and Sevastopol Rayons 157
4.6b T versus V/E, Khmel'nitsky Rayons 157
4.6c T versus V/E, Zakarpas'ka Rayons 157
4.6d T versus V/E, Zhytomyr Rayons 158
4.6e T versus V/E, Odessa Rayons 158
4.7a Turnout Distributions, 2004, Rounds 2 and 3 164
List of Figures

4.7b Turnout Distributions, 2004, Third Round Precincts 164
4.8a T versus V/E, Donetsk Rounds 1–3 167
4.8b T versus V/E, Luhansk Rounds 1–3 167
4.8c Distribution of V/E for Yanukovich, Donetsk 2004 167
4.9a T versus V/E, Donetsk Round 3, Precincts 168
4.9b T versus V/E, Luhansk Round 3, Precincts 168
4.10 T versus V/E, Lviv Rounds 1–3 169
4.11 T versus V/E, Lviv Round 3, Precincts 170
4.12 Regression Coefficient on Turnout, Round 3, 2004 170
4.13 Example of Aggregation Error 171
4.14a Distribution of Proportion Urban, Lviv Rayons 172
4.14b T versus V/E, Lviv Round 3, City versus Village Rayons 172
4.15a Turnout Change between Rounds 1 and 3, 11:00 A.M. 177
4.15b Turnout Change between Rounds 1 and 3, 3:00 P.M. 177
4.15c Turnout Change between Rounds 1 and 3, 8:00 P.M. 177
4.16a Against All, First Round, Yushchenko Rayons 180
4.16b Against All, First Round, Yanukovich Rayons 180
4.16c Against All, Second Round 180
5.1 Turnout Distributions, Ukraine 2006 190
5.2a T versus V/E, Party of Regions Rayons, 2006 191
5.2b T versus V/E, BYuT and Our Ukraine Rayons, 2006 191
5.3a T versus V/E, Donetsk Rayons 2006 193
5.3b T versus V/E, Luhansk Rayons 2006 193
5.3c T versus V/E, Lviv Rayons 2006 194
5.3d T versus V/E, Lviv Rayons 2006, BYuT and Our Ukraine 194
5.4a Vote for Regions, 2006 versus 2007 203
5.4b Vote for BYuT, 2006 versus 2007 203
5.4c Vote for SPU, 2006 versus 2007 203
5.5 Turnout Distribution, 2007 204
5.6a Lviv Turnout 2004 versus 2007 Precincts 206
5.6b Lviv Turnout 2006 versus 2007 Precincts 206
5.7a T versus V/E, Lviv Oblast City Precincts 2007 207
5.7b T versus V/E, Lviv Oblast Rural (Village) Precincts 2007 207
5.8a Volynsk and Ivano-Frankivs'k Turnout, 2004 and 2007 208
5.8b Ivano-Frankivs'k Turnout 2007 208
5.9a T versus V/E, Volynsk Oblast Precincts 2007 209
5.9b T versus V/E, Ivano-Frankivs'k Oblast Precincts 2007 209
5.10 Donetsk Oblast Turnout 2007 211
5.11 T versus V/E, Donetsk Oblast 2007, Party of Regions 213
### List of Figures

5.12 T versus V/E, Donetsk Oblast 2007, SPU

5.13 T versus V/E, Donetsk Oblast 2007, Regions and SPU

5.14 Luhansk Oblast Turnout 2007 versus 2004(3)

5.15 T versus V/E, Luhansk Oblast 2007

5.16a T versus V/E, Donetsk 2007 Districts 48, 49, 54, 55, Regions

5.16b T versus V/E, Donetsk 2007 Districts 48, 49, 54, 55, SPU

5.16c T versus V/E, Donetsk 2007 Districts 48, 49, 54, 55, Regions and SPU

5.16d T versus V/E, Donetsk 2007 Districts 39–47, 50–53, Regions

5.17 Distribution of SPU’s Share of the Eligible Electorate, Donetsk Precincts 2007

5.18a T versus V/E, Zaporizhzhia 2007, Party of Regions

5.18b T versus V/E, Zaporizhzhia 2007, SPU

5.19a T versus V/E, City of Odessa 2007

5.19b T versus V/E, Regions, Odessa Oblast, Districts 134–141

5.19c T versus V/E, SPU, Odessa Oblast, Districts 134–141

5.19d T versus V/E, Regions and SPU, Odessa Oblast, Districts 134–141

5.20 Grading the SPU versus Regions and the CPU, 2007

5.21 T versus V/E, If Fraud Had Been Done with Skill

6.1a Turnout in San Francisco County Precincts 2004

6.1b T versus V/E, San Francisco County Precincts 2004

6.2a T versus V/E, North Carolina, 2004, Bush Precincts

6.2b T versus V/E, North Carolina, 2004, Kerry Precincts

6.2c Turnout Distribution, North Carolina, 2004

6.3a T versus V/E, Mecklenburg County, North Carolina, All Precincts

6.3b T versus V/E, Mecklenburg County, North Carolina, Bush Precincts

6.3c T versus V/E, Mecklenburg County, North Carolina, Kerry Precincts

6.4a Turnout Distribution, Arizona 2004

6.4b T versus V/E, Arizona 2004, All Precincts

6.4c T versus V/E, Arizona 2004, Bush Precincts

6.4d T versus V/E, Arizona 2004, Kerry Precincts

6.5a Turnout Distribution, Dade County, Florida 2000

6.5b T versus V/E, Dade County, Florida, Gore Precincts 2000
List of Figures

6.5c  T versus V/E, Dade County, Florida,
       Bush Precincts 2000 245
6.6   T versus V/E, Broward County, Florida,
       All Precincts 2000 246
6.7a  Turnout Distribution, Idaho
       247
6.7b  T versus V/E, Idaho, All Precincts 2004
       248
6.8a  T versus V/E, Idaho, Kerry Precincts 2004
       248
6.8b  T versus V/E, Idaho, Bush Precincts 2004
       248
6.9   Turnout Distribution, Texas Counties 2004
       251
6.10a T versus V/E, Texas 2004, All Counties
       251
6.10b T versus V/E, Texas 2004, Bush Counties
       251
6.11a Turnout Distribution, Franklin County, Ohio, 2000
       253
6.11b Turnout Distribution, Franklin County, Ohio, 2004
       254
6.12  Turnout Distribution, Cuyahoga County, Ohio, 2004
       254
6.13a T versus V/E, Franklin County, Ohio,
       Bush Precincts 2000
       255
6.13b T versus V/E, Franklin County, Ohio,
       Gore Precincts 2000
       255
6.14a T versus V/E, Franklin County, Ohio,
       Bush Precincts 2004
       255
6.14b T versus V/E, Franklin County, Ohio,
       Kerry Precincts 2004
       256
6.15a T versus V/E, Cuyahoga County, Ohio,
       Bush Precincts 2004
       256
6.15b T versus V/E, Cuyahoga County, Ohio,
       Kerry Precincts 2004
       256
6.16a Turnout Distribution, Hamilton County,
       Ohio, 2004
       257
6.16b T versus V/E, Hamilton County, Ohio,
       Bush Precincts 2004
       258
6.16c T versus V/E, Hamilton County, Ohio,
       Kerry Precincts 2004
       258
6.17a Turnout Distributions, Hamilton County,
       Ohio, 2000
       259
6.17b Turnout Distributions, Hamilton County,
       Ohio, 1996
       259
6.17c Turnout Distributions, Hamilton County,
       Ohio, 1992
       259
6.18a T versus V/E, Hamilton County, Ohio,
       Bush Precincts 2000
       260
6.18b T versus V/E, Hamilton County, Ohio,
       Gore Precincts 2000
       260
### List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.19a</td>
<td>T versus V/E, Hamilton County, Ohio, Dole Precincts 1996</td>
<td>261</td>
</tr>
<tr>
<td>6.19b</td>
<td>T versus V/E, Hamilton County, Ohio, Clinton Precincts 1996</td>
<td>261</td>
</tr>
<tr>
<td>6.20a</td>
<td>T versus V/E, Hamilton County, Ohio, Bush Precincts 1992</td>
<td>262</td>
</tr>
<tr>
<td>6.20b</td>
<td>T versus V/E, Hamilton County, Ohio, Clinton Precincts 1992</td>
<td>262</td>
</tr>
<tr>
<td>6.20c</td>
<td>T versus V/E, Hamilton County, Ohio, Bush Precincts 1992</td>
<td>262</td>
</tr>
</tbody>
</table>