Yerevan's

May 2009 Municipal Election:

Statistical Analysis

**"Better Policies.
Better Future."**

POLICY FORUM ARMENIA

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Policy Forum Armenia

Mission Statement

Policy Forum Armenia (PFA) is an independent professional non-profit association aimed at strengthening discourse on Armenia's economic development and national security and through that helping to shape public policy in Armenia. PFA has a hybrid mission, operating as a think tank as well as an advocacy group. Its main objective is to offer alternative views and professional analysis containing innovative and practical recommendations for public policy design and implementation. Through its activities, PFA aims to contribute to the creation of an informed public and more effective and accountable government. PFA's main asset is its worldwide network of professionals and leaders in their respective fields, with dedication to Armenia.

Operational Objectives

PFA has a hybrid mission. It primarily operates as a think tank, since its output will comprise of expert assessments and analysis using latest social science research methodologies and will benefit from scholarly exchange. In addition, to the extent that the PFA would advocate for, and have impact on, the social change in Armenia and the Diaspora, it would also function as an advocacy organization.

Vision

We strive to build Armenia as a country and society where:

Government is transparent and fully trusted by its subjects; Its main objective is the current and future well-being of citizens and nationals abroad; Its members are equally accountable before the law in the same manner as any other citizen of the country and have no direct commercial interests.

Judiciary is free, fair, and incorruptible.

Legislature is competent and respectable.

Civil service is the most respected form of employment, because it provides an opportunity to serve the country and people, and is highly professional.

Society has high standards of living; It is well educated, tolerant, and humane.

Economy is at the frontier of progress and innovation, building upon the human capital of the Nation as a whole; It offers equal opportunities for everyone; It does not tolerate unfair competition and redistributes through efficient and fair taxation.

Environment and responsible management of natural resources are essential to the survival of the State, and are key elements of well-being of future generations.

Human rights are the most sacred set of values.

Citizens of Armenia - Armenians, Yezidis, Greeks, Kurds, Russians, and others alike - are the most valuable asset of the State.

Armed Forces are by far the strongest in the region by spirit and dedication of its men and women, by its advanced armament, and by significance of its mission to protect life, history, and culture.

Diaspora and Armenia form a single entity, the Nation. Its stake in Armenia and Armenia's development are recognized and encouraged; Its potential is fully internalized; Its members have dual Armenian citizenship.

History is of essence. **Future** is where we aim.

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Abbreviations

ALSP   Armenian Labor Socialist Party
ANC   Armenian National Congress
ARF   Armenian Revolutionary Federation
CEC   Central Election Commission
CLP   Country of Law Party
PAP   Prosperous Armenia Party
PP   People's Party
RPA   Republican Party of Armenia

I. INTRODUCTION

The analysis presented below is based on preliminary data of the Central Election Commission of Armenia (CEC) on the Yerevan municipal election held on May 31, 2009.[1] The objective of this report is to examine the statistical properties of the data—including by comparison with 2008 and 2007 election data, where relevant—to reveal any anomalies and irregularities. It is important to note from the outset that certain types of election fraud would not create statistical anomalies and hence could not be detected by statistical analysis such as the one presented below. Examples of these types of fraudulent activities include, but are not limited to, across-the-board (i.e., uniform or sufficiently widespread) bribes in exchange for votes or the use of coercion to obtain votes.[2]

The focus here is on indications of fraud that can be detected by statistical inference: ballot stuffing and vote stealing (i.e., artificial augmentation of vote counts). The methodology used in this report was originally developed by Sobianin and Sukhovolskiy (1993) and Sobianin, Gelman, and Kaiunov, (1994) in application to Russia's 1993 constitutional referendum and later developed in a series of published papers by Michael Myagkov (University of Oregon), Peter Ordeshook (California Institute of Technology), as well as in the context of Armenia's 2008 presidential election by Policy Forum Armenia (see PFA, 2008). Below we focus on four measures that have been identified in the ensuing empirical literature as potential indicators of election fraud: (1) distribution of voter turnout (2) distribution of individual parties' votes, (3) relationship between the parties' votes and voter turnout, and (4) distribution of invalid ballots. The following sections describe in detail these indicators and the relationships among them.

II. TEST 1: DISTRIBUTION OF VOTER TURNOUT

In most elections when the number of polling stations is large enough, it is expected that the voter turnout (as well as the share of votes cast in favor of any party or candidate) will follow a normal (or Gaussian) distribution.[3] Thus, a chart depicting the number of polling stations reporting a certain turnout (or percentage of votes for a party or candidate) based on an election conducted without irregularities is shaped like a bell curve, with the top of the bell representing the average, median and mode of the distribution (e.g., Myagkov *et al.*, 2005, and our own calculations based on 2007 parliamentary elections in Finland, which are available upon request).[4]

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[1] The advantage of using preliminary instead of final data is that the latter contain information on six more polling stations (polling stations 7/7, 7/9, 8/1, 8/3, 8/5, 8/15) the outcomes in which were nullified following an official recount. Throwing these 6 observations out (i.e., using the final data) would have provided a biased picture of irregularities that took place. Where possible, these 6 polling stations are highlighted throughout the analysis.

[2] Allegations of both types of fraudulent activities are available from Transparency International, "Youth Will" NGO and Armenian National Congress reports.

[3] Hereafter, turnout (T) is defined as share of voters (S) that showed up at the polling station within the total number of eligible (E) voters registered at the same polling station.

[4] More formally, a normality of distribution for any large number of variables is followed from Lyapunov's Central Limit Theorem. The latter requires that the random variables in question be independent for their sum/average to be normally distributed.

Figure 1 depicts the distribution of polling stations as a function of voter turnout during three elections in Armenia: May 2009 Yerevan municipal election, February 2008 presidential election and May 2007 parliamentary election. For comparison purposes, 2007 and 2008 charts are based on data from Yerevan districts only.

Figure 1: Distribution of Election Turnout, 2007-09
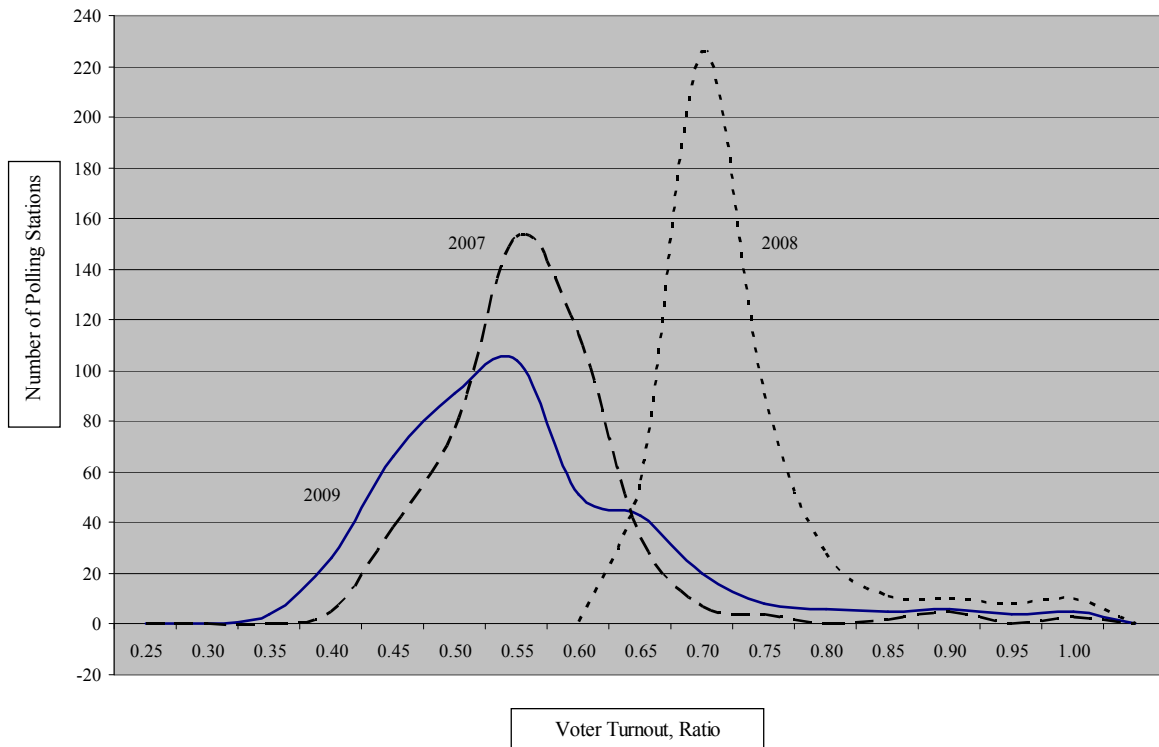
Notwithstanding the larger-than-expected number of polling stations with high turnout (i.e., 85 percent and higher, shown by the right tails), both the 2007 and 2008 curves are largely well-behaved and resemble normal distributions (albeit with different means and variances).[5]

However, the 2009 curve does not maintain the typical bell shape, having an unusual bump in addition to a fat tail on the right, patterns that constitute augmentations of the expected normal distribution. The 2009 curve also has a much larger variance compared to the 2007 and 2008 curves indicating unevenness of higher degree of political activism and participation across polling stations. The bump on the 2009 curve resembles closely those in: (1) Armenia's districts outside Yerevan during the 2008 presidential election (see Figure 1 in PFA, 2008), (2) Russia's federal republics during the 1996 and 2000 presidential elections, and the 1995, 1999 and 2003

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[5] The issue of unusually high turnout during the 2008 election is discussed in detail in PFA (2008).

Duma elections, and (3) Ukraine's second round of 2004 presidential election, all largely considered to have a high degree of irregularities (see PFA, 2008, and Myagkov *et al*., 2005).[6]

Figure 2 depicts the relationship between voter turnout in the 2007 and 2009 elections across polling stations.[7] While most dots are lined up along a 45-degree line indicating comparable levels of participation in 2007 and 2009, there are several outliers. Interestingly, a large number of polling stations that recorded a high turnout in 2009 had recorded low turnout in 2007 (area A). This number is about three times the number of polling stations that recorded high turnout in 2007 but low turnout in 2009 (area B). As indicated in Figure 2, four of the six polling stations where results were nullified by the CEC are part of this peculiar subset (highlighted individually inside area A).

Figure 2: Correlation between Voter Turnout in 2007 and 2009
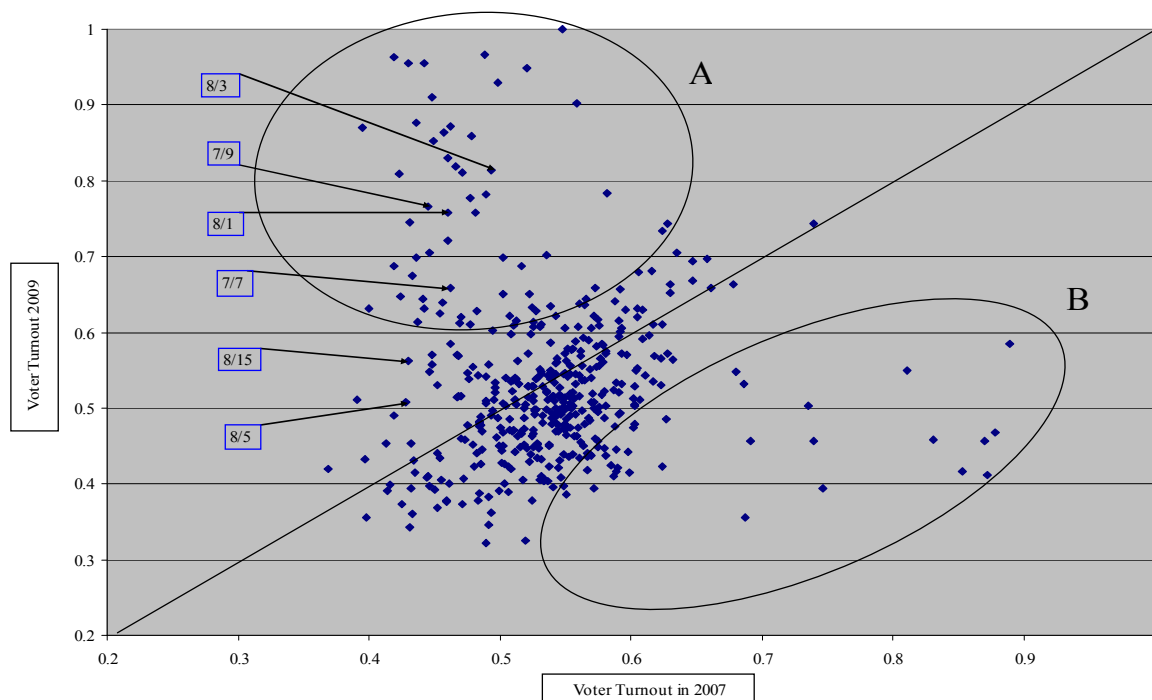
Note: Polling stations where the results were nullified by the CEC are marked. Notation is as follows: 8/1 indicates 1st polling station of the 8th election district, etc.

Looking at the data further, Table 1 below reveals another questionable pattern of voter turnout. It appears that the highest voter turnout was registered in districts 7 and 8 (with averages of 72 and 66 percent, respectively), where reports of violence and fraud were abundant. These are also the districts with six polling stations invalidated by the CEC. These two districts registered highest standard deviations of turnout, which by itself would be indicative of fraud, since it

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[6] This type of augmentation of the distribution would be inconsistent with an overall higher turnout across all polling stations (e.g., as a result of higher political activism across the country, in which case the entire curve would shift rightward) but would be consistent with excessive activity in only a sub-set of polling stations.

[7] Slight modifications were made to the list of polling stations by the election authorities to which the analysis here is adjusted.

would suggest large variations in voter turnout among otherwise demographically similar polling stations.

Table 1: Distribution of Voter Turnout by District (May 31, 2009)

	District Number:												
	1	2	3	4	5	6	7	8	9	10	11	12	13
No. of polling stations	33	34	35	32	34	33	33	33	30	34	34	35	39
Average Turnout	0.53	0.53	0.5	0.45	0.5	0.52	0.72	0.66	0.51	0.48	0.56	0.56	0.44
St. dev. of Turnout	0.073	0.091	0.043	0.044	0.106	0.043	0.145	0.155	0.055	0.05	0.098	0.094	0.075

The lowest turnout was registered in districts 4 and 13 (45 and 44 percent, respectively). Interestingly, the 4th district is the Arabkir area of Yerevan where elections activities reportedly took place without major incidents.

The following sections attempt to answer two questions: how is the high turnout likely to have been generated, and which of the candidates benefited from the excessive turnout?

### III.   TEST 2: DISTRIBUTION OF INDIVIDUAL PARTIES' VOTES

As hypothesized above, votes cast in favor of any party or candidate across a sufficiently large number of polling stations should broadly follow a normal distribution. Figure 2 below depicts the distribution of votes for four frontrunner parties during the May 2009 election and their respective candidates (where available) during the 2008 presidential election for comparison.

The pattern of voting for the ruling Republican Party of Armenia (RPA) is essentially the same in both years. Notwithstanding the bumps on the right side of the curve (suggesting excessive voter turnout in about 30-40 polling stations each year), the rest of the curve in both years appears to be reasonably well-behaved.[8] This could indicate two things: (1) no fraud to benefit RPA (again, those polling stations with excess turnout being exceptions), and (2) uniform fraud to benefit RPA, which technically would shift the curve to the right in a parallel fashion while preserving its (normal/Gaussian) shape.

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[8] Calculating the exact number of stations with irregular voter turnout would require measuring the integral underneath these curves and above the normal distribution consistent with each of the curves. It is nevertheless possible to infer—based on the shapes of the curves—whether irregularities occurred and if they were sizable.

Figure 3: Distribution of the Shares of Four Frontrunner Parties in 2008 and 2009
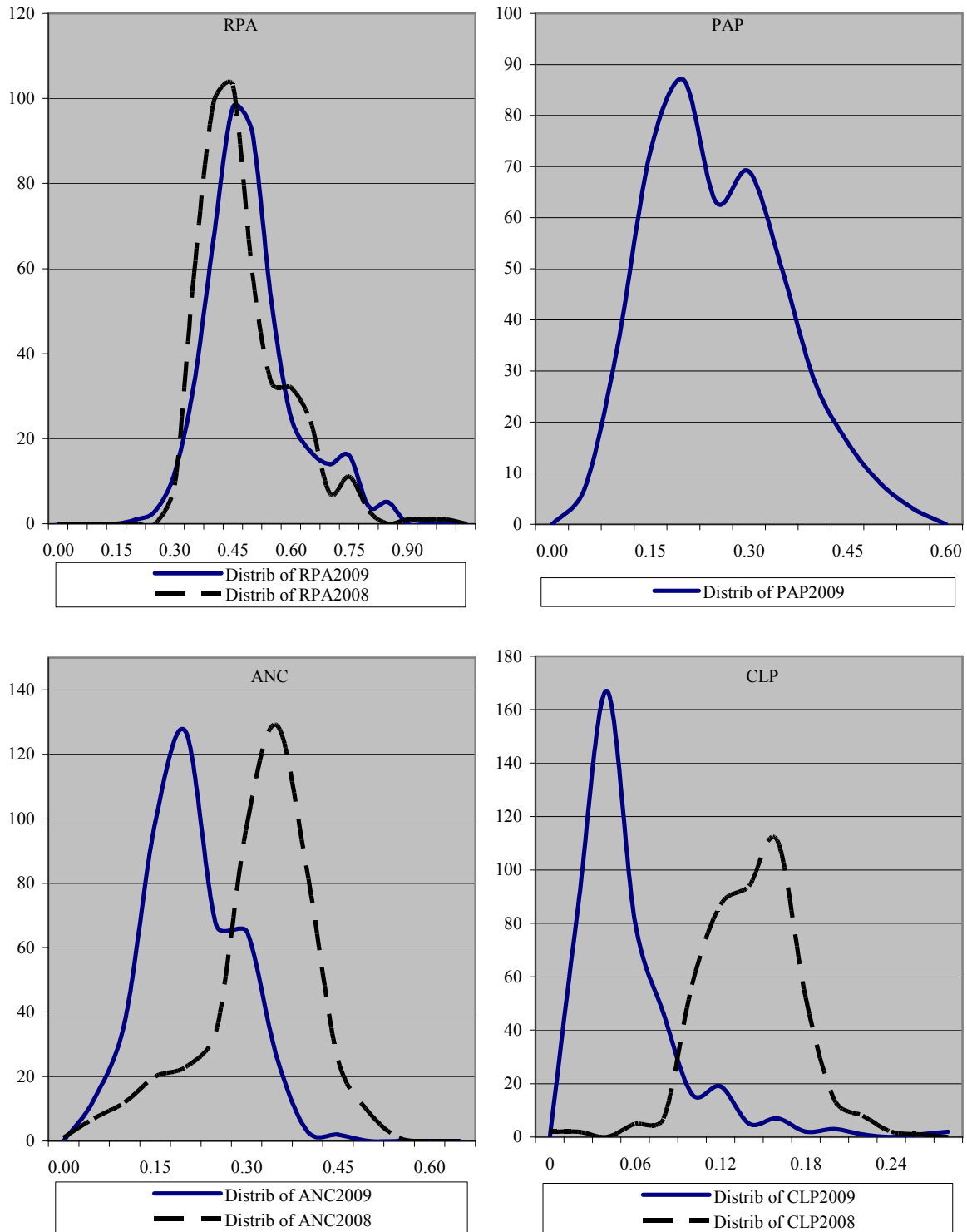
Category X-axis: share of votes cast in favor of each party/candidate in total, by polling station; category Y-axis: number of polling stations.

The Prosperous Armenia Party (PAP) curve has a clear bipolar structure in 2009. (The party did not participate in 2008 election). Given the party's access to resources[9] and its ability to defend itself against fraud, this suggests fraud to *benefit* the party (i.e., the right bump is the "illegitimate" one) instead of fraud *against* the party in certain districts.[10] It is also possible that the bump is a result of higher than average popularity of PAP in these districts and its capacity for voter mobilization.

In the case of the main opposition Armenian National Congress (ANC), the situation appears to be different in 2008 and 2009 not only in terms of the mean/mode/median of the distribution but also in terms of the shape of the curve.[11] The nature of the augmentation of the 2008 curve vis-à-vis a normal curve (that is, a small bump to the left from the main peak) suggests that votes for its candidate were artificially deflated (albeit less so in Yerevan than across the regions of Armenia, as explored in PFA, 2008).

In 2009, however, ANC's curve registered a bump to the right from the main peak. As hypothesized earlier, this could indicate the following three things: (1) fraud to benefit the ANC, (2) higher popularity of the ANC's candidate in some polling stations but not others, and/or (3) fraud of much greater magnitude against the ANC that would shift much of the curve to the left (compared to where it could have been without fraud). Given the ANC's clear underdog status and lack of adequate resources (to match those of the incumbent) in this election, the first option is highly unlikely.[12] The second option is potentially possible given the social and demographic differences among voters across districts in Yerevan. However, given the history of election conduct in Armenia and the anecdotal evidence in support of this option, the third option remains the most plausible one. The probability increases if one considers that the ANC was the largest, if not the only representative of the opposition active in this election representing a vast majority of Yerevan's politically disenfranchised population.[13]

There were reports of ANC's proxies being forcibly removed from the polling stations or being forced to disregard illegal activities, paving the way for fraud to take place.[14] Another reason behind ANC's poor showing in some polling stations could be related to the fact that some rogue opposition Heritage party representatives in local election commissions followed orders from

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[9] The party leader, Gagik Tsarukyan, is widely believed to be the wealthiest oligarch in Armenia, with ties to the former president Robert Kocharian.

[10] Reports of fierce competition for votes among the two pro-establishment parties, the RPA and the PAP, were numerous. See, for example, "Government Loyalists Clash in Yerevan," RFE/RL, May 13, 2009. Available at http://www.azatutyun.am/content/article/1731149.html.

[11] Although the ANC was created after the 2008 election (and therefore legally did not participate in the 2008 election), virtually all parties or groups comprising the ANC formally supported the presidential bid in 2008.

[12] As this report goes to press, there are no known reports of ANC-orchestrated fraud on May 31.

[13] The second largest opposition party, Heritage, did not run in the May election, but despite the tension with the ANC, supported the latter during the pre-election period.

[14] See, for instance, media reports on the voting day issued by www.lragir.am, www.a1plus.am, and "Legal Ambulances" at www.hra.am, as well as election observation report issued by IYC, Transparency International and post-election statements of Armenian National Congress.

RPA/PAP representatives.[15] All in all, the conditions on the ground have worsened since 2008, leaving the opposition largely unprotected against intimidation and open use of force by the pro-establishment parties.

One reason why this could be the case is a drastically smaller number of foreign observers monitoring the election and potentially preventing election fraud from taking place. Speaking at the Library of Congress, Washington, DC on June 30, 2009, the US Ambassador to Armenia Marie L. Yovanovitch discussed her experience of the May 31 election:

> In the precinct where I observed the vote count, two parties approached the chairman to get him to change their tally. He refused, noting that there was nothing he could do because observers were present. The plus side is that the count wasn´t changed; the negative is that there was an expectation that it could be changed – and it clearly was in a number of precincts as other Embassy observers witnessed.[16]

The distribution of the Country of Law Party (CLP) votes is noteworthy as well. With some exceptions, the 2008 curve shows little signs of tampering (the curve is largely well-behaved). In 2009, the distribution becomes positively skewed (no longer resembling normal), with a high concentration of polling stations with share of votes for the CLP candidate around 4 percent. Noteworthy also are a higher-than-predicted number of polling stations with more than 10 percent votes recorded in favor of the CLP (fat tail to the right). Finally, similar to the ANC case, the distributions in 2008 and 2009 differ drastically in terms of their averages.[17]

The following section examines these patterns and their causes them more closely.

IV. TEST 3: RELATIONSHIP BETWEEN THE VOTES CAST AND VOTER TURNOUT

Another test proposed by Sobianin and Sukhovolskiy examines the link between the share of individual candidates' votes and voter turnout. They argued that the slope coefficient of the Ordinary Least Squares (OLS) regression of a candidate's share of total eligible voters on turnout should be a positive number less than one, and close to the share of votes collected by that candidate across all polling stations.[18] If the resulting slope is much larger than the

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[15] See "8th District Outside of Control," (in Armenian) *Lragir.am*, Available at http://lragir.am/src/index.php?id=country&pid=26542.

[16] The complete speech is available at http://armenia.usembassy.gov/news060909_amb.html.

[17] This difference could be attributed to the fact that the CLP's lead candidate in the 2009 election was much less popular and experienced than the candidate in 2008. Another possible reason for this—which will be consistent with the meager showing in 2009 of another top performer during the 2008 election, the Armenian Revolutionary Federation (ARF)—would be the decision by the party leadership to join the governing coalition, which has been argued (e.g., PFA, 2008) to have given a green light to the country's political leadership of the time to perpetrate the events of March 1-2, 2008.

[18] The described regression for the jth candidate and i^{th} polling station can be written in the following way (ignoring the constant term for presentational simplicity): $V_{ij} / E_i = \beta \cdot T_i + \varepsilon_i = \beta_j \cdot S_i / E_i + \varepsilon_i$, where, V is the number of votes received by the candidate, T is turnout (defined as S divided by E), S is the number of eligible voters who showed up at the polling station to vote, and E is the total number of eligible voters. ε is the error term. It can be

party's/candidate's share of votes, this would indicate: (1) ballot stuffing to benefit this particular party/candidate, and/or (2) mobilization of voters beyond the normal turnout that would disproportionately support the party/candidate in question and not the others. If the resulting slope is larger than 1, this would indicate that not only the particular party/candidate in question benefited from every additional ballot added to the final count, but also from votes subtracted (i.e., stolen) from other parties/candidates.

Table 2 below presents the results of OLS regressions of parties' voter shares on voter turnout and a constant term, for all seven parties contesting in 2009 election. To put things in perspective, we also ran the same regressions for the 2008 election, limiting the sample to election districts in Yerevan only.

Table 2: Regression Results for Yerevan, 2008-09

	2009				2008		
	Intercept	Slope	t-stat.	Actual share of the vote	Intercept	Slope	t-stat.
PAP	-0.03	0.28	12.28	0.226	...	...	...
PP	0.01	-0.01	-2.45	0.022	0.01	-0.01	-5.96
ANC	0.13	-0.06	-5.73	0.185	0.39	-0.28	-7.90
ARF	-0.02	0.08	12.95	0.045	-0.01	0.09	5.81
ALSP	0.00	-0.0003	-0.40	0.005	...	...	...
RPA	-0.03	0.52	19.66	0.468	-0.54	1.21	27.88
CLP	-0.06	0.17	15.96	0.048	0.08	0.02	1.28
No. of obs.	439				442		

Note: The table contains estimated coefficients for OLS regressions (V_{party}/E) = *Intercept* + *Slope**Turnout + ε for each party. Reported t-statistics are for hypothesis H_0: Slope=0 against the alternative H_1: Slope≠0. All slope coefficients with the exception of the ALSP in 2009 and the CLP in 2008 are highly statistically significant. Actual share of the vote represents the share of votes cast in favor of each party in total as calculated based on the preliminary sample.

On the surface, the relationships for PAP, ARF, and RPA in 2009 resemble the theoretical prior: the estimated linear relationships have an intercept of nearly zero (column 2) and a slope coefficient (column 3) that is close to the actual share of votes they obtained during the election (column 5). However, while this closeness was formally rejected,[19] the slope coefficient for RPA

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shown that the following estimator $\hat{\beta}_j = \sum_i V_{ij} / \sum_i S_i$ (which is the share of votes collected by the jth candidate

across all polling stations) has an expected value equal to that of the OLS estimator (i.e., where $E(\hat{\beta}_{jOLS}) = \beta_j$)

plus a (small) term. This term is smaller, the smaller the disparity in size of polling stations, and becomes zero if all polling stations have equal number of eligible voters.

[19] The one-sided hypothesis of the coefficient for these parties (individually) being equal to their respective actual share of votes (against the alternative hypothesis that the coefficients are greater than the share of the votes cast in their favor) have all been rejected, suggesting that these parties benefited disproportionately from increased turnout.

in 2009 declines dramatically compared with that in 2008, suggesting much less fraud (ballot stuffing and vote stealing) to benefit the party.[20]

Second, the slope coefficients for the ANC, the Peoples' Party (PP), and the Armenian Labor Socialist Party (ALSP) are negative, indicating that not only they were not able to retain their share of votes as a result of (or with) incremental increases in voter turnout, but they actually lost votes cast in their favor as turnout increased. This pattern indicates vote stealing during the vote count. The negative coefficients are the largest in magnitude for the ANC, suggesting that they have lost more than others as a result of increased turnout. In fact, in the two districts with the highest voter turnout, ANC's candidate received the lowest share of votes.

Third, the estimated slope coefficient for the CLP is much larger than the total share of the votes received during the election.[21] In fact, this makes the CLP the most significant beneficiary of the votes "lost" by the ANC, PP, and ALSP. Indeed, in a number of polling stations that had a very high turnout, the CLP received extremely high level of votes, which went into the fat tail of the distribution on Figure 3. Noteworthy in this respect are polling stations 7/5, 7/6, 8/3, 8/9, 8/12, 8/13, 8/16, and 8/21-23 with above 70 percent turnout where the CLP received at least 15 percent of the vote (having a Yerevan-wide mean of less than 5 percent).[22]

These observations suggest that while stuffing ballots and/or subtracting votes illegally during the vote count, the scale of these activities has declined since 2008, which could reflect the need for a particular outcome above a threshold. Specifically, while the intention in 2008 could have been to reach a legally binding threshold of 50 percent plus 1 vote or else face a run-off,[23] the objective in 2009 must have been much more modest: to come first, and if possible to collect 40 percent of the vote in order to unilaterally appoint the city mayor.

It is also conceivable that there could have been an explicit upper limit for the share of votes to be collected by the establishment candidate during this election. It is possible that the election outcome registered by the leader of the RPA (i.e., Serge Sargsyan) during the 2008 presidential election across districts in Yerevan (i.e., 45.5 percent) could have in fact served as the limit not to be exceeded administratively by a lower ranked and less popular RPA politician running for the mayoral post. While difficult to prove, should this ceiling really exist, it could be shown mathematically that for any given level of true/actual turnout, there would be a maximum amount of ballots that could be stuffed without breaching that ceiling. That is to say, if more than the maximum number of ballots is stuffed (all of them presumably to benefit one candidate) the ceiling will be exceeded. In fact, the smaller the true turnout, the less room a ballot stuffer has before he/she hits the ceiling. Since the true turnout is not possible to determine until the polls

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[20] In 2008, RPA's candidate received approximately 120 votes from every 100-voter increase at a polling station, a strong sign of artificially increased turnout and vote stealing.

[21] This is shown by a one-sided statistical test similar to one conducted for RPA, PAP, and ARF (see footnote 18 above).

[22] Things were particularly out-of-the-ordinary in polling stations 8/22 and 8/23, where with registered turnout of 95 and 93 percent, the CLP "received" 27 and 28 percent of the vote, respectively.

[23] Which may explain the unusually high recorded turnout necessary to generate sufficient votes in favor of the candidate in question.

close, this ceiling is likely to have been exceeded in some polling stations by overzealous supporters of the establishment candidate (who stuffed more ballots than they should have), resulting in a city-wide outcome that exceeded the ceiling by a small margin (i.e., 46.8 vs. 45.5 percent).

The section that follows looks at the potential for ballot stuffing during this election from a different angle.

V.   TEST 4: DISTRIBUTION OF INVALID BALLOTS

The final test builds on the relationship between invalid ballots and voter participation. As argued by the authors of the methodology, there should be no statistical relationship between the share of invalid ballots and voter turnout. As the number of people who showed up to vote in a polling station increases, so does the number of invalid ballots, typically in a proportionate manner. For example, for a polling station with uniform demographics where there are 2 invalid ballots for the first 100 voters who showed up, there will be 20 invalid ballots after 1,000 voters showed up to vote (i.e., in both cases the share of invalid ballots is 2 percent). This number is unlikely to be systematically different across polling stations and should be independent on voter activism (i.e., turnout).[24]

Figure 4 below depicts a scatter plot of the share of invalid votes as a function of voter turnout, along with a linear trend. The relationship clearly indicates that in polling stations with high voter turnout there is generally a lower share of invalid ballots. What this most likely indicates is that when ballots were stuffed, the ballot stuffers failed to *ex ante* invalidate a portion of those additional ballots, resulting in the share of invalid ballots in total going down. Note also the somewhat high concentration of polling stations with very low or zero invalid ballots and high turnout rates (area A).

A comparison of regression results with the 2008 outcome offers interesting insight. The negative relationship between the share of invalid ballots and voter turnout is less pronounced in 2009 than in 2008: the slope coefficient on turnout has a value of -0.006 in 2009 and -0.07 in 2008, both statistically significant. This could suggest that: (1) there was less ballot stuffing in 2009, and/or (2) intentionally or unintentionally, the ballot stuffers used at least some invalid ballots while stuffing ballot boxes.

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[24] Another possibility is that a factor that helps secure a lower share of invalid ballots also influences the voter turnout. The most likely suspect for that would be (better) education, which could reduce the number of invalid ballots and (through higher civic activism) also increase voter turnout. However, the pattern of our data does not support this possibility. In fact the opposite is being observed in our sample: most polling stations with artificially high turnout are located in areas of the city that traditionally have much lower education levels than the city average.

Figure 4: Share of Invalid Ballots as a Function of Voter Turnout
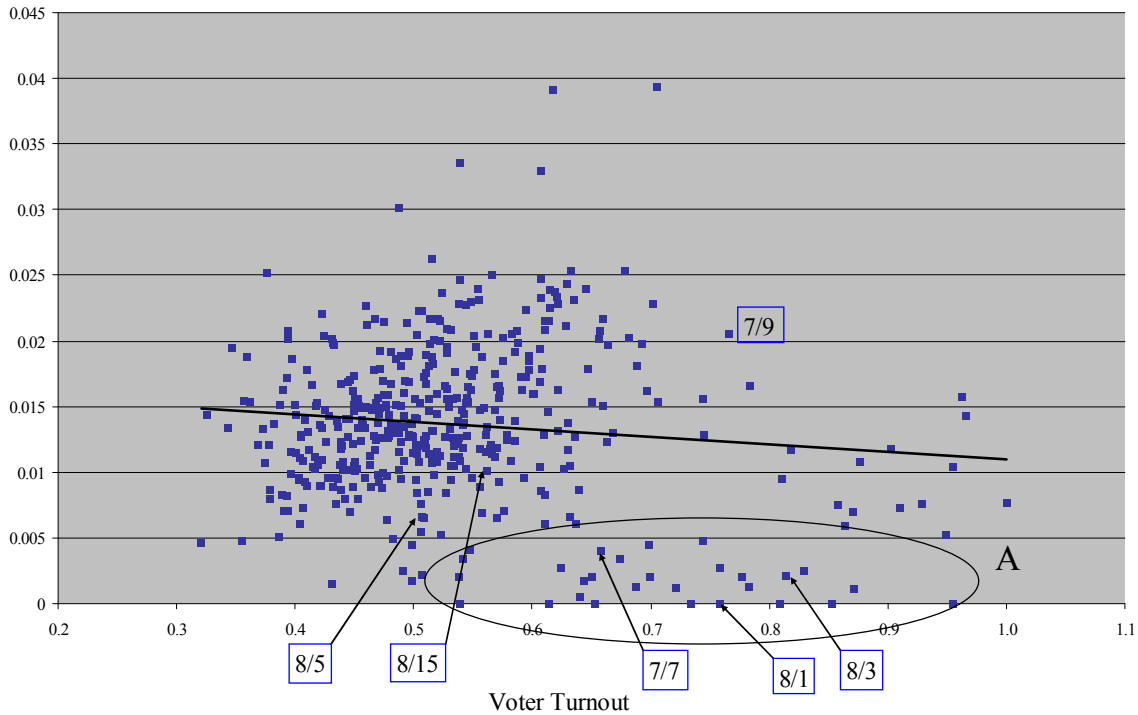
Note: Polling stations where the results were nullified by CEC are marked. Notation is as follows: 8/1 indicates 1st polling station of the 8th election district, etc.

It is noteworthy to witness that three of the six polling stations where the results were nullified were picked by this test. Given that the outcomes in the remaining three polling stations could have been invalidated for reasons other than ballot stuffing, this outcome is truly remarkable as it speaks to the strong predictive power of the test. If this indeed is the case, this test could be used to reveal anomalies in other polling stations. For instance, it could be useful to have the results in the following 10 polling stations (all at the bottom part of area A) re-counted: 5/10, 7/5, 7/10, 7/23, 8/9, 8/14, 8/22, 8/24, 9/4, and 13/2. (Not surprisingly, seven of the 10 strongest suspects according to this test come from notorious Malatya-Sebastya, districts 7 and 8). More generally, the analysis shows that the six polling stations where the results were nullified are far from being unique in terms of the outcome recorded. Several dozen other polling stations could be candidates to contain similar irregularities, as shown throughout the analysis. Recounting the ballots in these polling stations and setting the record straight would have been the best way for the election authorities to counter the allegations of electoral fraud that continue to taint election conduct in Armenia.

VI. CONCLUSION

The results presented above do not prove election fraud. They offer indications of fraud that should be taken into serious consideration. Similar to PFA's assessment of the 2008 presidential election, all four empirical tests utilized above offer evidence of fraud and irregularities, including but not limited to ballot stuffing and stealing of opponents' votes during the vote count.

More specifically, the analysis above suggests the following likely strategy for fraudulent activities during the election:

- Voter turnout was artificially inflated in some polling stations (Test 1; Figures 1 and 2, Table 1) presumably to reach a particular target for voter participation;

- In polling stations where the true turnout was too low, ballots were stuffed in favor of both the establishment party and, to a lesser extent, another friendly party, to avoid generating implausibly high percentages for the establishment party (Test 2; Figure 2 and Test 3; Table 2);

- In polling stations where true turnout was relatively high thus requiring less ballot stuffing, the dominant mode of fraud was vote stealing—augmenting the final vote count in favor of the main establishment party (Test 4; Figure 4).

Given the consistency and strength of evidence, the above analysis casts serious doubt on the trustworthiness of yet another election outcome in Armenia. Evidence collected by various observers on election day points to widespread irregularities and fraud, consistent with the findings reported above. Indeed, the United States Mission to the OSCE (2009) reported the following:

> Based on reports by election observers from our embassy in Yerevan and on our discussions with other local and international observers, we could only conclude that the voting process on Election Day was marred by widespread fraud and intimidation. We observed incidents of ballot-stuffing, multiple voting, falsified vote counts, intimidation of party proxies and observers, and the illegal presence of unauthorized and unidentified individuals in polling stations. These clear violations of OSCE commitments—and of the Armenian Election Code—were especially egregious in Yerevan's Malatia-Sebastia district, but were observed in other electoral districts as well. They unfortunately repeated a disturbing pattern of similar violations witnessed in previous elections in Armenia.

Much of the evidence collected by independent local observers and media (e.g., Hetq Online, Lragir and A1Plus) points in the same direction. While some legal cases have been brought against the perpetrators to address the blatant falsifications found in districts 7 and 8, some would argue that—given how the process is handled—it will do little, if anything, to return confidence to the citizens of Armenia in their country's electoral process.

The outcome of May 31 demonstrates that election results in Armenia do not follow any established patterns, at least not similar to those in democratic countries. A recent study published in the Oxford Bulletin of Economics and Statistics (Leigh, 2009), using data from 268 democratic elections held between 1978 and 1999, stresses the importance of both "luck" (economic conditions world-wide), and "competence" (ability of the incumbents to deliver better growth than that in the rest of the world) in election outcomes. The paper also shows that voters are more likely to reward competence in countries that have higher average income and education levels.

According to the official results of the May 31 election, however, this does not appear to be the case in Armenia. The ruling party candidate was declared a winner in 2009 despite: (1) a global crisis of epic proportions, (2) a domestic economic recession that far outpaces the declining global output trends, and (3) an ongoing internal political crisis with still unresolved events of March 1-2, 2008. Could it be that—consistent with Leigh (2009), if only in reverse—falling income and educational standards in Armenia make the rest of the world's regress irrelevant and reward incompetence of local politicians? Unlikely, we would say, and would instead point to the direction of the integrity of the election process/data and the inability of the opposition to put its act together and show a plausible way out.

<p style="text-align:center">* * *</p>

The outcome of the May 31, 2009 municipal election in Yerevan did not produce any surprises. This was a result of a process that has been long in the making, perhaps since 1996.[25] A small minority—the country's top political leadership and oligarchs—has grown disproportionately wealthy and increasingly less aware of the aspirations of the majority of country's citizens. As a result, elections have become largely irrelevant and should perhaps be reevaluated by the disenfranchised majority as a means of participating in the governance of the country. Sadly, Armenia's patchy economic performance of recent years—so highly praised by international financial institutions—may have contributed to this outcome by making this small minority powerful enough to prevent any meaningful reform.[26] It remains to be seen whether Armenia's opposition—itself not a stranger to questionable election conduct and otherwise unable to innovate—could break this vicious cycle and prevent the country's slide down this *kakistocratic* path.[27] The alternative, we are afraid, will have irreversible consequences going forward.

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[25] See PFA (2008) for a brief history of Armenia's election conduct since independence.

[26] See R. Giragosian, "Weathering the Storm: Political Democracy and Economic Development," www.Armenianow.com, July 3, 2009.

[27] *Kakistocracy* [Ancient Greek κακιστος (*kakistos*, "worst")], government under the control of a nation's worst or least-qualified citizens (http://en.wiktionary.org/wiki/kakistocracy).

References

United States Mission to the OSCE (2009). "Statement on Municipal Elections in Yerevan," Vienna, June 11. Available at: http://www.usa.am/news/2009/june/news061109.pdf.

Leigh, A. (2009). "Does the World Economy Swing National Elections?" *Oxford Bulletin of Economics and Statistics*, Department of Economics, University of Oxford 71(2), pp. 163-81.

Myagkov, M., P. C. Ordeshook, and D. Shakin (2005). "Fraud or Fairytales: Russia and Ukraine's Electoral Experience," *Post-Soviet Affairs* 21, No. 2.

Ordeshook, P. and M. Myagkov (2008). "Russian Elections: An Oxymoron of Democracy," CalTech/MIT Voting Technology Project Working Paper No. 63.

Policy Forum Armenia, 2008. "Armenia's 2008 Presidential Election: Select Issues and Analysis," *PFA Special Report*, available from www.pf-armenia.org.

Sobianin, A. and V. Sukhovolskiy (1993). "Elections and the Referendum December 12, 1993 in Russia: Political Results, Perspectives and Trustworthiness of the Results," unpublished report to the Administration of the President of the Russian Federation, Moscow, 1993; as reported in Myagkov, Ordeshook, and Shakin (2005).

Sobianin, A., E. Gelman, and O. Kaiunov (1994). "The Political Climate of Russia's Regions: Voters and Deputies, 1991-93," *The Post-Soviet Review* 21, No. 1.