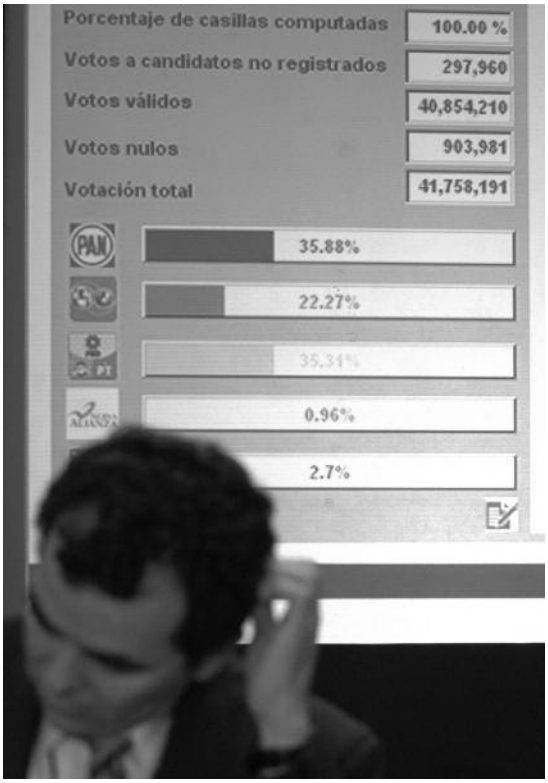
Fraud or Human Error In Mexico's Presidential Election?

Javier Aparicio*



Iván Stephens/Cuartoscuro

Screen at the Federal Electoral Institute showing preliminary results in the presidential elections.

Mexico's recent presidential election put the whole electoral system, from candidates to citizens and authorities, to the test.[1] Soon after election day, one of the losing candidates and other observers alleged that fraudulent practices of different sorts took place on July 2. Above and beyond the use of allegations of fraud as a political strategy, do these claims hold any water? There are no definitive tests for electoral fraud, but a statistical analysis of polling data from the more than 130,000 polling places can shed some light on the issue.

Quick Count, PREP And the District Tally

The statistical consistency between the election results estimated by the quick count, the PREP (a preliminary report system executed in

* Economist and professor at the Political Studies Division at Mexico City's Center for Economic Research and Teaching (CIDE). javier.aparicio@cide.edu

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real time right after polls close), and the district-level count (the official Federal Electoral Institute tally computed three days later), all of which pointed in the same direction, constitutes the earliest evidence of a reliable election. Why? The quick count, taken from 7,636 voting stations on election-day, could not indicate a clear winner beyond the margin of error. But this count indeed suggested an outcome with a margin smaller than 0.6 percent, and it also gave National Action Party (PAN) candidate Felipe Calderón a slightly higher probability of leading. A few days later, the district count gave him a 0.58 percent margin of victory (243,934 votes), thus validating the quick count estimate. Clearly, if the official district tally had been too far off from the quick count, either one or the other procedures could be under suspicion.

Since we did not have a clear winner on the evening of election day, everybody looked for clues into the PREP minute-by-minute data flows. The pattern of these data flows, which almost always gave a consistent lead to Calderón, seemed a bit surprising to some, and the "cybernetic fraud" claim was born. As it turns out, such fraud is useless because what matters is the final outcome and not who leads the data flow every hour. Moreover, any manipulation of PREP data would last only 72 hours, just when the official tally would come out.

How come the PREP did not show any "switches" between Calderón's lead and Andrés Manuel López Obrador (AMLO) if the election was so close? First of all, the PREP is not an entirely random data gathering process based on any sample (as was the case of exit polls and quick counts). Non-random factors, such as whether localities are urban or rural and different time zones, affect the time that it takes for the polling place results to reach the 300 district centers that uploaded these data. So, if urban polling stations are uploaded somewhat sooner than rural ones, and if one candidate leads in urban areas, the PREP data flow will favor that candidate. Calderón led AMLO by 691,000 votes in urban locations (about 70 percent of polling stations), whereas AMLO led him by about 450,000 votes in rural areas. But urban locations were uploaded sooner than rural ones, thus producing the observed pattern on the PREP.

Right after the PREP finished, some argued that three millions votes were missing. The missing votes came from what is known as "inconsistent tally sheets," polling tally sheets with errors or important data omissions such as leaving the vote count of one candidate blank instead of writing in a zero. 11,184 sheets were not included in the PREP estimates but were kept in an alternate filing system. All political parties were aware of this procedure but not the public, and perhaps López Obrador's team used this fact to his advantage.

The official district tally was done July 5 and 6 at the 300 different district council offices that the Federal Electoral Institute (IFE) has around the country. It was surprising to some, because in this tally, AMLO had the lead for several hours before the reversal of the trends. How come? This tally was even less random than the PREP. In each district, each polling booth tally sheet had to be discussed and approved before being computed. If "blue districts" (districts won by the PAN) were more heatedly debated than PRD "yellow districts"—since PRD representatives demanded recounts in many of the former— then AMLO would lead the tally for a while. This happened to be the case. Instead of an urban bias, the district tally had a politically-induced partisan bias that gave AMLO an advantage that steadily decreased until it reversed to the final outcome.

ARITHMETIC ERRORS IN POLLING STATION TALLY SHEETS

About a week after the election, the coalition behind AMLO challenged the official IFE district tallies both on Mexico City's streets and at the Electoral Tribunal of the Federal Judiciary (TEPJF). Key sources of concern were the so-called arithmetic errors in polling station tally sheets. The polling station tally sheet includes the number of ballots received, used and left over, as well as the number of citizens who voted and the votes cast for each candidate. Clearly, if any of these fields is mis-

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counted or misreported, the tally sheet will not add up. For instance, if the station received 600 ballots and 400 votes were cast, there should be 400 marks on the voter roster and 200 ballots left over. If the sheet has mistakes, it appears to have more or fewer votes with respect to the number of citizens who voted, or with respect to the number of ballots received minus those left over.

Where do these errors come from? It is worth noting that Mexicans vote on paper ballots that are counted by four fellow citizens, who are chosen at random to serve as polling station officials. These citizens set up the station and count as many as 2,250 paper ballots for the three elections held that day (for president, senators and deputies). Each station is also monitored by representatives from each political party. Arithmetical errors occur because either the station officials miscount or misreport some ballots, or because voters fail to deposit their ballots in the right box (there are three boxes) or station (some stations are side by side). Until this election, we did not know how large or how often these errors occurred but they are not entirely new. About 46.7 percent of the tally sheets for the presidential election had some sort of error, whereas in 2000, 51.4 percent of them had similar mistakes. The average size of these errors is ±4.36 votes, that is, about 1.35 percent of the votes cast at each station.

Can these errors be decisive for the election outcome? For that to be the case they would have to be biased in favor or against one of the candidates, that is, they would have to appear more often in one type of station than another. However, a statistical analysis of the distribution of arithmetical errors indicates that they were as likely to appear in polling stations won by the PAN as those won by AMLO's coalition. Moreover, the average size of the errors is the same in either group of voting stations. This suggests random human errors that affect the leading candidates similarly and therefore are not decisive for the outcome. This is true even if the election had an average margin of victory of 1.8 votes per voting station because what matters is not only the size but also the distribution of errors —and they were found to be randomly distributed.

Recounting Votes

Another source of uncertainty, which underlies the demand for a total recount, was whether the polling station tally sheet figures truly corresponded to the actual ballots cast. On this issue, a formal statistical analysis requires that a random or representative sample of polling booths be recounted to assess the size and distribution of counting errors. Such a recount would help to detect the likelihood of fraudulent alterations by station officials, randomly chosen citizens, as it were. The casuistic logic of the Electoral Tribunal and the very nature of the legal challenges introduced, however, did not produce a recount in a random sample but a recount in a set of challenged polling places.

These caveats aside, the evidence available allows for some partial inferences. During the IFE district tally, some 2,864 polling booths were recounted for a number of reasons; later on, the tribunal ordered a partial recount of 11,839 additional polling stations. In neither case were the polling stations randomly chosen, resulting in a biased sample that does not allow for direct extrapolations. For instance, 66.4 percent of the 2,864 polling booths recounted by the IFE belonged to "blue districts" while only 33.4 percent came from "yellow districts." This recount produced fewer votes for each candidate and resulted in a slight percentage increase in Calderón's vote margin.

If one divides the IFE recount sample into "blue and yellow" districts (that is, districts won by Calderón or AMLO, respectively) an interesting asymmetry emerges. When blue precincts were recounted, Calderón lost an average of 4.7 votes per precinct whereas AMLO lost about 1.9 votes, which results in a reduced margin of 2.9 votes between the two leading candidates. On the other hand, when yellow precincts were recounted, Calderón lost an average of 5.8 votes per precinct whereas AMLO lost 13.3 votes, which yielded an increase in the margin of victory of 7.5 votes in favor of Calderón.

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This seems to indicate a number of tentative findings. First, when polling station results are recounted, both candidates lose votes, but the candidate with the most votes in a given area will lose relatively more votes after the recount. Secondly, random errors may cancel out in a random sample but not necessarily in a biased sample. Thirdly, a recount in a biased sample will produce a biased adjustment of the vote tally, which cannot be extrapolated directly to a larger recount. This means that further analysis of any of the recounts of this election should be interpreted with caution.

As of the date I write this, there is no polling-station-by-polling-station information on the results of the 11,839 stations recounted by the tribunal. However, we know that this sample was more biased than that of the IFE recount. 91.4 percent or 10,818 polling stations recounted came from blue districts and only 8.6 percent or 1,021 came from yellow districts. Since we also know that Calderón led AMLO by an average of 76.5 votes in blue districts, it was possible to predict that the tribunal recount would result in a decreased vote margin for Calderón without reversing the final outcome. This is what occurred in the September 5 final, definitive tally, when the margin of victory decreased from 0.58 percent to 0.56 percent. In any event, if these recounts had produced a systematic or relatively large change in the vote tally, they would suggest some sort of fraud, but this was not the case.

WERE ATYPICAL POLLING STATIONS DECISIVE?

It has been argued that the criteria used by the tribunal to annul polling stations with "determinant errors" only (that is, only when the error found was larger or equal to the margin of victory of the polling station under study) amounts to ignoring mistakes that could decide the election outcome in the aggregate. Statistically, one could apply stricter rules to polling stations with errors and analyze the hypothetical results.

For instance, if not only some but all the polling stations with arithmetical errors are eliminated from the tally, it turns out that the winner continues to be Felipe Calderón by an even larger margin of votes. Secondly, if we eliminate all the areas with a turnout over 75 percent —the national average was 58 percent— from the final tally, which implies removing as many as 4,555 polling stations, it turns out that Calderón still leads but by a smaller margin. If the election outcome can withstand excluding polling stations with errors or a high turnout, one concludes that those precincts were not decisive. Clearly, the tribunal cannot and does not apply any such criteria without case-by-case evidence or justification —its mission is to preserve as many votes as possible, not to cancel them without reason.

FINAL REMARKS

To summarize, statistical analysis of polling-station-level data from the 2006 Mexican presidential election suggests that cybernetic, arithmetic or miscounting errors were not decisive for the election outcome. Most errors found in the polling station tally sheets seem to be due to random human error. A recount in a representative or random sample would have been desirable to add further confidence to these conclusions, and surely remains an important area for reform.

Finally, it is worthwhile emphasizing that delegating the organization of election day to randomly chosen citizens is a safe way to ensure impartiality that perhaps comes at the cost of random human error. It may be possible to design mechanisms to reduce errors in counting ballots and filling in voting station tally sheets but we will hardly find a more impartial one. Further reflection and analysis of this presidential election will surely help us to assess the weaknesses and strengths of the electoral system. But it will also put in perspective to what extent some of the accusations of fraud had any substance or were just part of the runner-up's larger political strategy. VM

NOTES

[1] This article summarizes work in progress, available at http://www.cide.edu/investigadores/aparicio/elecciones/